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Journal

Vol. 62; No. 1 • January/Janvier • 1996

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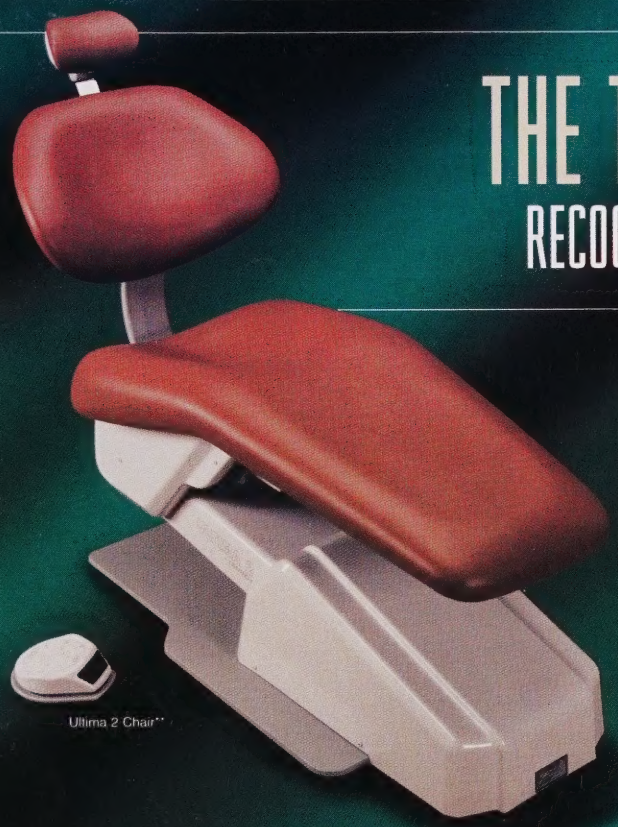

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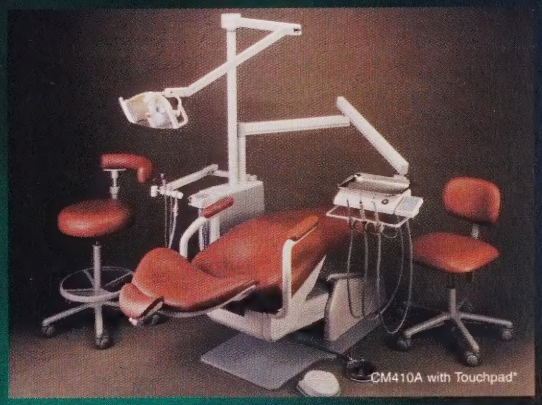

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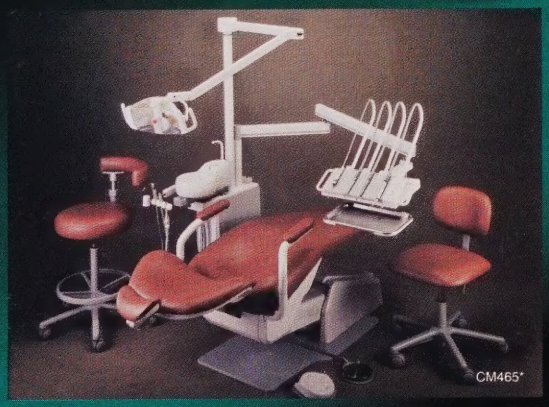

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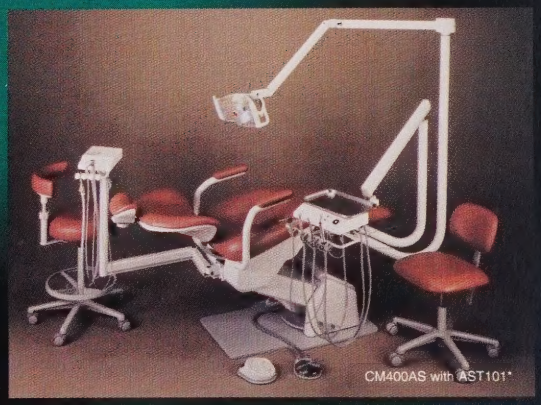

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JANUARY/JANVIER 1996
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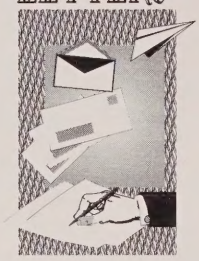

Latvian Dental Project

I have recently returned from a teaching visit to Latvia, and thought I should report that the Canadian Dental Association has a real presence there. There are now two complete years of the *Journal of the Canadian Dental Association* on the shelves of the dental faculty's new library, which are available to — and in active use by — both staff and undergraduates.

The library is steadily improving with materials donated by the University of Toronto dental faculty, private dentists, corporations and publishers coming in with most heartening regularity. And as it gets better, skills in its use are steadily improving. This is one of the more important elements in the regeneration of our profession in Latvia, and we are tremendously encouraged with its progress.

The CDA's presence through its *Journal* amplifies the Canadian aspect of the overall Latvian Dental Project, and will, I believe, have some influence on the form that a projected association of Latvian dentists will take. I am most grateful to my association for the support you are giving to our undertaking. It confirms the pride I take in being a member.

Silvija Janusonis, DDS
Brampton, Ontario

Discrimination

What a shock to read Dr. Myron A. Peterson's comments on the Ottawa HIV Discrimination Case, as published in the November '95 *Journal* (HIV Discrimination Case (Letters To the Editor). *J Can Dent Assoc* 61(11):944, 1995).

What troubles me even further is the fact that the "friends" and the other staff of the operating room will only take extra precautions cleaning the instruments and the operating theatre after a considered contaminated case is presented. Do they indeed possess a crystal ball that advises them on who is infected and who isn't? How can they guarantee that the patient they are operating on is not infected? Worse yet, what about their colleague standing next to them?

I believe the best solution to avoid facing the Human Rights Commission or any discipline panel is to constantly practise with the thought that the patient you are treating has full blown AIDS. This way, all the consumers of dental services will be treated with utmost care, as one never knows who is really infected. Then, and only then, will the public truly be protected. Politically correct? No, just protecting the rights of everyone concerned.

Ginette Lafond, BA, B.Ed., M.Ed.
Patient Advocate
and Public Appointee
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Diagnostic Tests

We read with interest a recent article by Dr. Matthews and colleagues (The Use Of Diagnostic Tests To Aid Clinical Diagnosis. *J Can Dent Assoc* 61(9):785-791, 1995). It is a nice overview of the concepts and equations on diagnostic tests. While we agree to most of what the authors say, we have to disagree with them on a number of points, and wish to point out a number of errors in the article:

1. "Diagnostic tests perform best when the estimated probability of the condition, based on clinical signs and symptoms, is around 50 per cent. Since flipping a coin would also result in the clinician being right 50 per cent of the time, his or her best estimate before further diagnostic testing is undertaken (i.e. the pretest probability) is no better than chance" (p. 786).

Dr. Matthews and colleagues suggested that diagnostic tests perform best when applied to a condition that has a pre-test probability of 50 per cent. We do not agree. Diagnostic tests perform best when the pre-test probability is equal to the chance probability. The chance probability of getting a head when flipping a coin is 50 per cent. The chance probability of getting a "six" when tossing a die is 1/6 or 16.67 per cent. The chance probability of getting a condition is equal to the prevalence of the condition, which varies according to the condition under study, and would seldom be 50 per cent. For example, the pretest probability of dental caries in an unscreened population might be about 30 per cent, and that of teeth indicated for extraction might be about eight per cent (our data). Diagnostic tests perform better when the pre-test probability of a condition is small, preferably under 50 per cent. When the pre-test probability of the condition is 50 per cent, the best performance of a diagnostic test is to increase the posttest probability to 100 per cent, which represents a 50 percentage point or two-fold increase over the pre-test probability. When the condition is rarer, e.g. the probability of the condition is 20 per cent, then there is more room for the diagnostic test to perform well. In this case, the maximum increase in the posttest probability to 100 per cent represents a 80 percentage point or four-fold increase over the pretest probability.

2. "-LR = Specificity/1-Sensitivity" (Matthews et al, 1995, **Table I**).

This equation for negative likelihood ratio (-LR) is wrong. The equation specifies a mathematical quantity which is numerically equivalent to what Choi[1] defined as negative predictive power (K_o), and not negative likelihood ratio. Matthews et al (p. 787) described correctly a likelihood ratio, "The likelihood ratio provides an indication of how many times more likely it is that a given test result will occur in diseased as compared to non-diseased individuals." Therefore, the negative likelihood ratio is the ratio of

the probability of a negative test in diseased individuals to the probability of a negative test in non-diseased individuals. Using the notations of Matthews et al (in their **Table I**), the correct equation is -LR = [c/(a+c)]/[d/(b+d)] = (1 - Sensitivity)/Specificity, see, for example, Choi.[2]

3. "In effect, a positive likelihood ratio is the odds that a positive test result will occur in a diseased individual as compared to a non-diseased individual. Similarly, a negative likelihood ratio is the odds that a negative test result will occur in a healthy person as compared to a person with the disease (p. 788)."

Here Dr. Matthews and colleagues made two errors. First, they used the term 'odds' incorrectly in both statements. Their definition of odds is correct in their **Fig. 3**, i.e. Odds = Probability/(1-probability), which is a ratio of a probability to one minus the same probability. On the other hand, a ratio is a ratio of a probability to another probability. In mathematical terms, Odds = $P_1/(1-P_1)$, and Ratio = P_1/P_2, where P_1 and P_2 are two different probabilities.[3] A likelihood ratio is a ratio and not an odds. Second, a likelihood ratio for a particular value of a diagnostic test is the "probability of that test result in the presence of disease divided by the probability of the result in people without the disease."[4] A negative likelihood ratio is the ratio of the probability of a negative test result among the diseased to the probability of a negative test among the non-diseased. These two statements should therefore read, "In effect, a positive likelihood ratio is the ratio of the probabilities that a positive test result will occur in a diseased individual as compared to a non-diseased individual. Similarly, a negative likelihood ratio is the ratio of the probabilities that a negative test result will occur in a person with the disease as compared to a healthy person."

4. "One advantage of the use of likelihood ratios over sensitivity and specificity is that they are unaffected by how common the disease is in the population (disease prevalence) (p. 788)."

This statement is wrong. It is a well-known fact that likelihood ratios, sensitivity, and specificity of a diagnostic test are all unaffected by disease prevalence.[1-2,4-6]

5. Finally, there is a typographical error in **Fig. 3**). The correct equation should be "Odds = Probability/(1 - probability),[4]" and not "Odds + Probability/(1-probability)."

We hope that the above clarifications are helpful to the readers of the *Journal* in understanding the basic concepts of diagnostic tests in clinical decision making.

Bernard C.K. Choi, PhD
Aleksandra Jokovic, DDS, M.H.Sc.
University of Toronto

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Authors' Response

We wish to thank Drs. Choi and Jokovic for their interest and comments regarding our manuscript on "The use of diagnostic tests to aid clinical diagnosis." In their letter to the editor, Drs. Choi and Jokovic contend that diagnostic tests perform best when the pretest probability is equal to the chance probability. We disagree and reaffirm that a diagnostic test is most useful when the pretest probability is approximately 50 per cent. We use approximately because, in practical terms, there is often a range in pretest probabilities from 30 to 70 per cent, depending on the clinician's experience with the disorder.

We do agree, however, that the prevalence (and preferably incidence) should be used to determine chance probability. In a clinical situation, this would then form the basis on which clinical experience, the characteristics of the patient, the signs and symptoms and other factors would be used to adjust (increase or decrease) the chance probability to a pretest probability.

In the example we gave, the prevalence of squamous cell carcinoma (SCC) in the population is only seven in 100,000, but, when the location and size of the lesion, the clinical signs found with visual examination, and other factors such as the patient's age, sex and lifestyle are taken into consideration, we increased the chance probability to a pretest probability of 40 per cent. This point is, perhaps, more eloquently described and illustrated by Sackett et al, *Clinical Epidemiology: A Basic Science for Clinical Medicine,* Second Edition, pages 91 to 93.

The equation presented in the manuscript for the negative likelihood ratio is indeed wrong, and we very much appreciate that error being pointed out. Also, the use of the word "odds" on page 788 is technically imprecise, and a better choice of word would have been probability or likelihood, or, as pointed by Drs. Choi and Jokovic, ratio.

Although it is well known, or at least often stated, that the likelihood ratios, sensitivity and specificity of a diagnostic test are all unaffected by disease prevalence, there is no evidence on which to base this statement (Kraemer, *Evaluating Medical Tests,* 1992, p. 92). Recent studies have shown that the sensitivity and specificity do change from one clinical population to another. (Hlatky et al, *American Journal of Medicine,* 77:64-71, 1984; Hlatky et al, *The American Journal of Cardiology,* 59:1195-1198, 1987).

We wish to thank Drs. Choi and Jokovic for their careful reading of our manuscript and the helpful comments they have provided.

D.C. Matthews, DDS, Dip. Perio.
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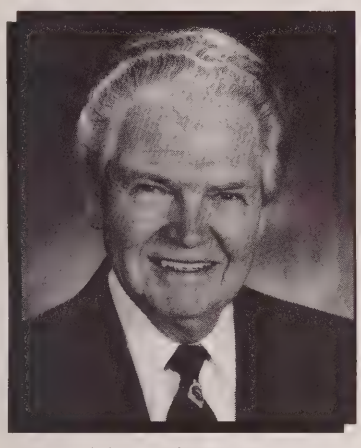
EDITORIAL

UNITY — NOW MORE THAN EVER



Dr. P. Ralph Crawford, Editor.

At the outset of a brand-new year, I can think of no message more important than a call for unity — in both our country and our profession.

Let's start with the country. Based on my own experience, I have a plan that might just nudge this Canada unity thing a notch or two in the right direction.

Years ago, when our two children were young, my wife and I decided that our family should see Canada first — from coast to coast — before visiting Disneyland, Europe, or any of the other tourist attractions out there. Considering all that our pioneering forbearers sacrificed and achieved to build this nation, we felt that the least we could do, surely, was to gain a better appreciation for the land they'd adopted and loved.

Our travels wouldn't be quite the same as theirs — no wagons and immigrant train coaches for us. We would cross the Prairie in a three-year old Chevy, over-night in motels, and lunch at McDonald's. We would drive east one year and west the next, allowing a month for each round trip.

I can tell you for a fact that most families haven't lived until they've driven 20,000 kilometres with two kids in the car. There were times when both family unity and sanity were severely strained. But compromise settled most of the major disputes. Like, we'll put up with one hour of your music if you put up with one hour of ours.

The logistics were quite simple. From our home in Winnipeg — the geographic centre of the nation — we drove through each of Canada's 10 provinces and visited the 11 capital cities, including Ottawa. To see as much of the country as possible, we took a northern route on the way out and a southern route on the way home. The end result was an experience that the four of us will never forget. To this day, whenever a family reunion brings us together, we relive our travels, and remember what it is to be Canadian.

We learned that being Canadian has nothing to do with provincial borders, or even with the natural boundaries created by the Ottawa River, the Prairies, and the Rocky Mountains. Canada, we discovered, really does stretch from Newfoundland's eastern tip to Vancouver Island's western shore. And no matter what part of the country we were in, the people we met were a lot like us.

Canadian dentistry is not much different. It also stretches from Newfoundland to British Columbia, held together through a federation of 10 provincial dental associations and a national association. Dentists are much like other Canadians, too. Despite provincial interests and needs, we have a common goal. We want to achieve optimal oral health for our patients, a reasonable standard of living for ourselves, and the inner satisfaction of knowing that what we are doing is worthwhile and appreciated.

And like the country we live in, dentistry's true goals and aspirations as a profession will only be attained if we forget about provincial borders and strive for greater unity. If we don't, we stand to see everything that we've accomplished over the past 100 years pulled apart. The signs are already out there. Dental hygienists in Alberta are claiming to be the only oral care providers whose primary focus is prevention, and the Ontario Dental Hygienists' Association has issued a press release stating that the high fees charged by dentists are restricting patient access to preventive oral health care.

These are actions that will ultimately affect every dental practice in the country. They're not mere provincial concerns, but trends that have clear national implications. And they're only the tip of the iceberg. Manitoba's denturists, for example, recently mounted an aggressive newspaper campaign invoking themselves as "denture specialists," while an aggressive entrepreneur has come up with a dubious guarantee in a bid to have its product and treatment mode incorporated into East Coast dental plans.

Surely, we can all recognize that this type of activity puts our patients at risk, and threatens our profession. If we are going to reach our oral health care goals, we have to cooperate and we have to speak with a united voice. The success of CDA's Enough Is Enough campaign against the taxation of dental plan premiums proves what we can achieve through unified action.

Numerous national issues — including managed care, waste control, the Charter of Rights, and dental education — are on our doorstep demanding attention. Success will depend on unity, and the willingness of our dental associations to strive toward a common goal. We must lay aside the tendency to only appease regional interests. The issues are too large, the stakes too high. Now more than ever before, dentistry needs a united front.

No one in Canadian dentistry has ever said it better than Dr. Eudore Dubeau, the secretary of the Quebec Dental Association. In 1902, he invited Canadian dentists to join a common cause, saying: *"Every dentist who can rise above mere local or provincial affairs in our country, and has thought about the immense advantages to be gained by the nationalization of the dental profession, should unhesitatingly give the idea his support."*

P. Ralph Crawford, BA, DMD
Editor of the Journal of the Canadian Dental Association

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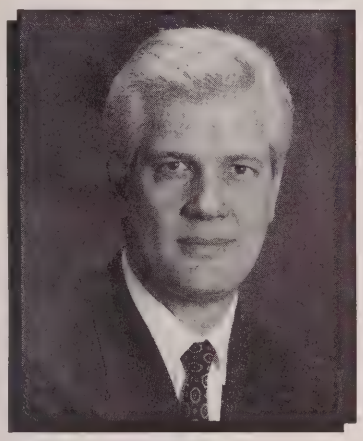


Dr. Jim Brookfield, CDA president.

Call it premonition, but I have a feeling that Finance Minister Paul Martin is taking another long, hard look at taxing employer-sponsored dental and health plan premiums.

When Mr. Martin appeared before the House of Commons Standing Committee on Finance last month, he promised to cut the federal deficit in half within two years. To do it, he'll either have to cut $17 billion in government spending, come up with some significant sources of new revenue, or achieve sizeable economic growth coupled with lower interest rates.

The problem, from dentistry's perspective, is that Mr. Martin isn't saying how he intends to meet his new target. I'm not a financial expert, but I do know that cutting the federal deficit to about two per cent of the Gross Domestic Product by 1997-98 will be no easy task. I also know, based on government estimates that it could bring in as much as $1.125 billion in new revenues, that a tax on health and dental plan premiums is still a very real possibility.

The gain in government revenues would be short-lived at best, however. All our research indicates that a premium tax would result in young, healthy Canadians opting out of their dental plans, leading to a rapid erosion of these plans and the ultimate demise of Canada's unique oral health care delivery system. The oral health gains that we have seen in Canada over the past 25 years would slip away, and treatment, rather than prevention, would become the norm in Canadian dentistry.

This would be unfortunate. Since 1986, thanks mainly to public education and fluoridation, prevention has occupied dentistry's centre stage. More people now visit the dentist for preventive care than for drilling and filling. The result has been very positive for all Canadians. Patients have enjoyed better oral health, and employers have gained a healthier, more productive workforce.

We would all like the tax fight to be over. This is the third straight year that a dental and health plan premium tax has been on the table, and we're still duking it out.

It would have been so easy to hang up the gloves last year, based on the success of our 1994-95 "Enough is Enough" campaign, and the strength of the 300,000 no-tax letters that flooded into Ottawa from concerned Canadians. Dentists and their patients sent government a very clear no-tax message last year, and that message was heard.

Unfortunately, politicians tend to have short memories. Although we'd like to rest on our laurels, proclaim victory in the no-tax campaign, and watch the 1996 budget debate from the sidelines, we can't risk it.

That's why CDA has been working so hard in recent months to build on the success of the "Enough is Enough" campaign and respond to the finance minister's concerns with respect to tax equity. Last fall, for example, we launched our MP-Dentist Contact Program to initiate an open dialogue with government on issues that concern dentistry, particularly the potential taxation of health and dental benefit plans. By the time you read this message, our contact dentists will have already met one-on-one with every MP in the country. We're taking our prevention message to Canada's politicians in the most direct way possible.

We also worked with the Action Plan Committee for Fair and Supportable Tax Treatment for Health and Dental Programs to assuage Mr. Martin's concerns over tax equity. The data we gathered indicates that 25.6 million Canadians, or 87.7 per cent of the population, are covered by some form of government or private supplementary health and dental plan, and that only 3.6 million Canadians have no coverage.

We delivered these numbers and our no-tax message to Mr. Martin last November, when we appeared before the House of Commons Standing Committee On Finance. It was a good session. We stated our position clearly and we received a favorable response. But I left the room wondering where we stand with the taxation issue. Something seemed to be missing from the hearing process this time around. Perhaps it was the new "round-table" format, but there wasn't the same amount of passion around the table that we saw in 1994, and the questions asked by committee members weren't nearly as blunt. This worries me.

As late as October, we had hoped that the MP-Dentist Contact Program, our work on the equity issue, our behind the scenes lobbying efforts, and the powerful message of last year's "Enough is Enough" campaign would win the day. But now we can't take that chance. Mr. Martin's recent economic statement has changed the rules of the game. We have no choice but to bring in fresh players and go public on the tax issue.

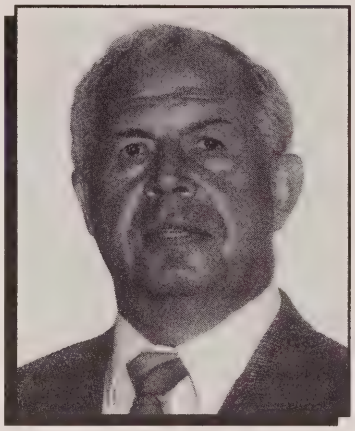
In December, CDA asked Canadian dentists to participate in a petition campaign against a dental and health plan premium tax. I urge you to do so. Make no mistake about it. This battle will be fought and won in the trenches.

Last year, there were dentists whose only action was to breathe a sigh of relief when the battle was won. That's not good enough. We have a responsibility to our profession and our patients to make a contribution to eliminate this threat. It's your profession, it's your future. And the oral health of your patients is on the line.

James R. Brookfield, DDS
President of the Canadian Dental Association

GUEST EDITORIAL

BACTERIA AND PERIODONTITIS



Max A. Listgarten, DDS

I was recently provided with a draft copy of a manual that is being produced by a Canadian company interested in promoting the widespread use by dentists of an in-office test for the detection of three periodontal pathogens.[1] The manual is designed to serve as a guide for incorporating this test into the management of patients with adult periodontitis.

Although my intent is not to criticize or endorse the recommendations put forward in the manual, I believe that it is appropriate to look more closely at the rationale for microbiological analysis and treatment.

In the past three decades, the primary etiologic role of bacteria in the pathogenesis of adult and other forms of periodontitis has been well established.[2] Initially, the role of bacteria was considered to be rather non-specific, with dental plaque mass being the major target for the dentist.[3] Conventional wisdom held that plaque mass should be kept to a minimum, and mechanical plaque control appeared to be reliable when carried out in a thorough and regular manner. Indeed, numerous studies have supported the value of plaque control as a cost-effective preventive and therapeutic approach for the management of most forms of adult periodontitis.

It also became apparent that plaque control was not the only answer. Despite excellent oral hygiene, periodontal tissue destruction could not always be adequately controlled. The classic example is localized juvenile periodontitis, a rather severe and rapidly progressing form of periodontitis that occurs in teenagers. This disease is not associated with prominent plaque deposits, but results from a specific infection by *Actinobacillus actinomycetemcomitans.* Rather than forming dental plaque, this microorganism tends to invade local tissues instead. Because the offending bacterium is located within the tissues rather than within dental plaque, routine oral hygiene procedures have little influence on the course of the disease.

The identification of *A. actinomycetemcomitans* as the major pathogen of localized juvenile periodontitis, and the successful treatment of the disease by elimination of this pathogen, emphasized the need to treat certain periodontal conditions as specific rather than non-specific infections. Ideally, a microbial test should be taken, prior to treatment, to identify the suspected pathogen and provide information as to its susceptibility to assorted antibiotics. Later, a follow-up test should be used to determine that the treatment has had the desired effect and that the targeted species has been eliminated.[4]

While some specific infections can be controlled by mechanical debridement and/or nonspecific antibacterial agents such as assorted antiseptics, antibiotics have been increasingly prescribed for the control of numerous infections. Unfortunately, they have been widely misused in some cases, both by the doctors who prescribe antibiotics to treat conditions for which they are largely ineffective, such as upper respiratory infections of viral origin, and by the patients who fail to follow the directions for taking their medication.

The consequent emergence of numerous strains of bacteria that are increasingly resistant to today's antibiotics has become a justifiable cause of concern for the medical profession. To control this trend, it is essential for doctors to use antibiotics with discrimination, at appropriate doses and schedules, and to target them toward specific bacteria.

Clearly, the logical approach to treatment is to control the infection by mechanical and/or chemical means as a first step. In most cases, adult periodontitis will respond quite well to conventional mechanical debridement, without the need for adjunctive antibiotics. Secondly, treatments should be undertaken to regenerate lost tissues or repair residual defects, to develop a health-compatible environment. And thirdly, patients should be monitored to insure that their periodontal health is maintained.

Antibiotic treatment may be justified for cases of adult periodontitis that are refractory to conventional treatment, early-onset forms of periodontitis, early stages of periimplantitis, and acute infections. They should not be considered as alternative forms of therapy for patients who fail to meet adequate standards of oral hygiene, however.

The authors of the Canadian company's manual acknowledge much of the above rationale for treating periodontitis, and deserve to be commended for emphasizing the importance of the bacterial etiology and the need to control it in order to treat patients successfully. It should be noted, however, that there is no single test available today that can be successfully used as an all-purpose microbiological diagnostic test. Neither culture, DNA probes, microscopic techniques (including immunofluorescence), or enzymatic tests (such as the BANA test recommended in the manual) are ideally suited for all situations.[5]

Culture is currently the only method available that will provide information on the antibiotic susceptibility of cultivable species. However, it is a complex, relatively expensive process, and only accounts for cultivable species.

Immunofluorescence and DNA probes are sensitive techniques, well-suited for the detection of selected species for which a specific antibody or probe is available. A number of pathogens can go unnoticed with either technique, however, if the test is not specifically designed to detect these pathogens.

The BANA test detects the presence of only three out of a dozen or more potential periodontal pathogens, and does not specify which of these pathogens is present, nor in what proportion. For example, the BANA test would be unable to detect *A. actinomycetemcomitans,* the primary pathogen of juvenile periodontitis. Therefore, the simultaneous use of several detection techniques may be required for a comprehensive evaluation of the periodontal microbiota.

As pointed out earlier, antibiotics should be used with care and only in situations where other antimicrobial approaches have failed to control the patient's periodontal infection. When needed, they should be selected based on their effectiveness against the intended bacterial target.

Although antibiotics can be effective adjuncts in the treatment of certain periodontal infections, the routine and arbitrary use of metronidazole, doxycycline or any other antibiotic for the treatment of periodontal infections should be discouraged. Their use is justified only when other methods to control the infection have failed, and preferably when appropriate tests have demonstrated that the antibiotic to be used is the best one for targeting the offending microorganisms. Most patients with adult periodontitis can be effectively treated with mechanical debridement, without adjunctive antibiotics. The latter should be prescribed judiciously, keeping in mind that the potential benefits of using these drugs should outweigh the negative side-effects resulting from their casual consumption.

Dr. Max A. Listgarten is a professor of periodontics at the University of Pennsylvania, Philadelphia, PA.

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EDITOR'S NOTE:

On October 13, 1995 a satellite symposium on the management of patients at risk of adult periodontitis was presented by the faculty of dentistry at the University of Toronto. Concern was expressed by some practitioners regarding the effective use of an in-office test for the detection of periodontal pathogens and the potential abuse of antibiotics.

Dr. Max Listgarten, a professor of periodontics at the school of dental medicine at the University of Pennsylvania has presented the above editorial to the *Journal.* In fairness, and to give balanced content to the topic, the *Journal* is reprinting an open letter sent to all Canadian periodontists by Mr. Ross Perry, president of Knowell Therapeutic Technologies in Toronto.

As with all modes of treatment, dentists are advised to thoroughly review the current literature to make proper value judgments.

An Open Letter to All Canadian Periodontists

There have been recent concerns raised in the periodontal community with regard to Knowell's "Combination Therapy" approach to treating periodontal infections. Some of these concerns are: a) the ability of the BANA test to diagnose periodontal disease; b) the expected abuse of antibiotics by the general practitioner; c) the perceived attraction of group dental plans to Combination Therapy; and, d) the role of the specialist versus the generalist.

These concerns need to be addressed with additional information to you and your colleagues in the dental community, so that together we can be accurate in assessing these new technologies, protocols and products in treating periodontal disease.

Let me first guide you to the instructional manual, *Combination Therapy,* which summarizes our approach to diagnosing and treating adult periodontal disease. This manual was written and edited by a panel of Canadian and American periodontists. It summarizes the science, and bases its guidelines for diagnosis and treatment on controlled double blind scientific studies. I recommend that you call Knowell at 1-800-463-2999 to arrange delivery of this report. Let me now deal with the concerns that I have heard.

A. The Ability Of The BANA Test To Diagnose Periodontal Disease

The BANA test alone does not diagnose periodontal disease, or replace any of your clinical observations. This test should be used in conjunction with all the other clinical signs and symptoms as part of the assessment and diagnosing process, and the results should help in your treatment planning. A useful way to monitor periodontal pathogens is to utilize a microbiological test, such as the BANA test, or laboratory methods available from the University of Toronto, the University of British Colum-

bia, or American universities. The BANA test measures the levels of a group of three anaerobes *P. Gingivalis, T. Denticola,* and *B. Forsythus,* above 400,000 CFUs. The literature suggests that about 90 per cent of adult perio is anaerobic, with the BANA test measuring whether the anaerobes are present above a certain level. A positive test has been shown to be correlated with both attachment loss and bone loss. As you know, the BANA test has been under research for over 10 years and is supported with over 27 scientific publications, which makes it the most published chairside test in the world. The test has proven to be both sensitive (95 per cent), and accurate (86 per cent), and is a useful diagnostic tool in addition to the observable clinical signs.

In some patients, conventional root planing and scaling will not adequately control the disease. For these patients, it makes sense to justify the treatment of the infection through education, and help determine the proper course of treatment (i.e. antibiotics and/or surgery). The BANA test is an affordable, easy, accurate chairside test to help do this assessment, not to replace the clinical observations. The BANA test will also provide the dental office with a tool to help: educate patients, monitor the scaling program and, if required, justify and monitor the proper use of an antibiotic.

B. The Expected Abuse Of Antibiotics By the General Practitioner

Given the emerging concern about resistance, the issue of antibiotic abuse is a valid one, if there are no controls or guidelines to justify the proper prescribing of the drugs. Antibiotics are not for everyone with periodontal disease, only an option for those 15-20 per cent who do not respond adequately to debridement. Science and experience suggest that the first line of defense is scaling and root planing, which should work to control the majority (about 80 per cent) of adult periodontitis. The remainder (15-20 per cent) require some form of alternative therapy. Controlled clinical research conducted by several independent researchers since the mid 1980s has proven that one of the effective alternatives in the treatment of adult periodontitis is a combination of physical debridement and short-term antibiotics. Knowell's Combination Therapy approach follows this research.

The issue of bacterial resistance from systemic antibiotic dosing is put to rest in the Combination Therapy manual (pages 29 and 30). Simply put, there is little, if any, chance that metronidazole will yield resistant microorganisms, if used appropriately.

C. Perceived Attractions By Group Dental Plans To Combination Therapy

In the dental industry, we all face corporations and plan sponsors who are extending recalls, cutting services, or completely eliminating dental plans. Our approach to this industry challenge is to argue for enhancing the dental plan, not cutting or changing it.

One of the general concerns seems to be that some Canadian dental plans appear to have incorporated Knowell's treatment plans to the extent that these plans will be using the BANA test alone to justify treatment. I am unaware of any group plan that has pursued this faulty objective, and Knowell would not support it. The BANA test should always be used with clinical judgment.

D. The Role Of the Specialist Versus the Generalist

Another concern is that the general practice dentist will be keeping the patient too long, or not referring them to the periodontist for specialized care. If you take a look at what happened to the medical community quite a few years ago, the concerns were the same. An example of this is the concerns of the medical GP and the cardiologist with respect to heart disease. The pharmaceutical industry developed new tests and therapies to treat high blood pressure and cholesterol. The cardiologist was then concerned that there would be improper drug use and a drop in referrals. However, through risk assessment and disease management, more tests are used to assess more patients. By making patients more aware of the risks associated with heart disease, more patients are now able to get treatment earlier, with an emphasis on prevention. This education and assessment scenario has made the GP and the cardiologist busier than they ever thought possible. The same potential exists in dentistry with caries and periodontal disease. Indeed, I have heard some specialists musing that they should equip their referral base with BANA incubators.

The role of the specialist and generalist is an issue to which Knowell is acutely sensitive. We dealt with it at length in our editorial panel in *Combination Therapy,* and I refer you to the opening statement in the introduction of this report.

We live in an age where technology is rapidly changing. Knowell Therapeutics is committed to work in partnership with the dental community to make these scientifically-proven treatments work for all practitioners, as well as their patients.

If you have any questions please do not hesitate to call.

Ross Perry, President
Knowell Therapeutic Technologies
Toronto, Ont.

DID YOU KNOW?

Myth Quote

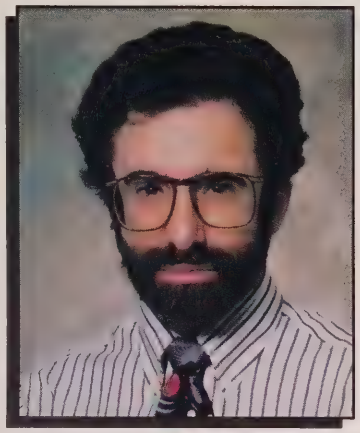
The Myth: Abraham Lincoln said: "You can fool all the people some of the time and some of the people all of the time, but you can't fool all of the people all of the time."

Background: Claims that Lincoln said it did not surface until more than 50 years after he was supposed to have said it. The remark was not recorded in any newspapers in Lincoln's time.

The truth: Some researchers attribute the remark to circus showman P.T. Barnum.

IT'S MY OPINION

RECOGNITION OF MEDICALLY NECESSARY ORAL HEALTH CARE



Joel Epstein, DMD, MSD

Miriam Grushka, DDS, PhD

Increasingly rapid changes in technology, regulations, and public expectations are having a profound impact on our daily lives as dental providers, and changing the way in which oral and dental disease is managed.

At the same time, the growing pressure on dentists to keep up with the new reality has been compounded by equally important changes in both population demographics and the prevalence of common dental diseases, including dental caries. Today's dentist faces intense competition for patients in an increasingly caries-free society.

Changes in the prevalence of systemic diseases and medical management, which may result in oral complications, have also affected the nature of dental practice. Dental education is addressing these issues, and has already begun a vigorous reassessment of the curriculum and clinical experience required for education of the future practitioner.

The status of dental education and practice was recently addressed in a major study conducted by the Institute of Medicine (IOM) of the National Academy of Sciences in the United States. According to the IOM report, dental education and dental practice are currently at a cross-roads due to scientific, technological, political and economic factors (*J Dent Educ* 59:6-15, 1995).

As a result of the IOM study and other initiatives in both dental education and practice, a dramatic shift in emphasis has been strongly suggested. Rather than recommending continued support for the status-quo, the IOM report discussed the position of dental education within the university itself, including the establishment of a closer relationship with medicine. This link, it said, would provide future dentists with increased medical knowledge and experience, at the same time as it responded to the needs of the growing number of medically compromised and older patients within North America.

Other recommendations suggested that future dentists should have increased experience in clinical medicine, as well as increased dental experience in a hospital environment. Without this exposure, IOM is of the opinion that dentistry may not be capable of meeting the oral health needs of our changing population.

IOM has established a list of recommendations that call on dentistry:

- To support effective oral health services that improve individual and community health, based on sound scientific evidence;
- To encourage outcome based research and/or formal consensus processes;
- To prepare future dental practitioners for more medically-based models of oral health care, to more effectively manage the more medically compromised and complicated patient.

To achieve these goals, IOM has identified the need for more integration between dentistry and medicine. Integration will provide greater experience for dental practitioners in relevant areas of medicine and hospital practise, according to the institute. To that end, IOM has recommended that the availability of both post-doctoral education in general dentistry and speciality programs should be increased. What may have been considered as satisfactory education in the past will no longer be adequate for the future.

Unfortunately, IOM has also observed that "the dental profession is at odds with itself" on a number of relevant issues, including workforce policies, licensure, and health care restructuring. At the same time, in Canada at least, the profession is witnessing reductions in some hospital-based dental programs, changes in the relationships of dental faculties within universities (many dental faculties are under pressure), and cutbacks at the level of health care delivery as a result of decreased provincial funding for oral care. These trends are expected to continue. Nevertheless, the maintenance of effective, efficient health care delivery within a hospital environment, as well as to medically compromised and complicated patients, is essential.

Specialty recognition must reflect the changing realities in dentistry to ensure that education, research, and clinical care are directed toward creating a medical model for providing oral and dental health care in Canada. Despite the changes occurring in the oral

health needs and demographics of Canadians, our current nationally recognized specialties have not specifically focused on these areas. While medicine has advanced with the recognition of additional areas of special expertise, such as geriatric medicine, dentistry has failed to identify and recognize the needs of Canada's aging population. We have yet to recognize the need for geriatric dentistry, hospital dentistry, and oral medicine directed toward the medically compromised or complex patient who requires dental management of complications secondary to medical therapy.

Instead of recognizing new dental specialities, we have forced our existing specialties to attempt to fill the void by expanding their current practice. Unfortunately, with the rapid expansion in knowledge and technology now occurring within the profession, this is an unworkable situation. The specialty of oral pathology, for example, has traditionally been identified by the certification that qualifies a pathologist to perform microscopic and other laboratory diagnostic procedures on tissue specimens. This service is vital to the dental community for the diagnosis and treatment of oral lesions. Today, however, the specialty of oral pathology must apply the latest developments in molecular biology in a complex area of laboratory medicine. Training in molecular biology must therefore increase to reflect the changing core knowledge in the biology of oral diseases.

These types of circumstances make existing specialties increasingly less able to expand their areas of practice. Instead of allowing further erosion to occur, we must strengthen our currently recognized specialties and recognize the need for other dental specialties to fill the public's health needs. We must maintain and expand hospital-based services, and recognize the need for graduate level education that addresses medically-related and oral health care needs in these more complex environments.

The Association of Canadian Faculties of Dentistry (ACFD) and the Canadian Dental Association have formed a committee to review some of these issues. Its task will be to develop a vision of the future of dentistry that prepares future dental professionals for what they will experience, and allows dental education and the dental profession to prepare sound policies for the next century in a proactive, realistic manner. The survival of a vigorous profession may depend on such action.

Dr. Joel Epstein is head of the department of dentistry, Vancouver Hospital and Health Sciences Centre, Medical-Dental Staff, British Columbia Cancer Agency, and a clinical professor at the University of British Columbia, Vancouver, B.C.

Dr. Miriam Grushka is an associate professor in dentistry, University of Toronto, a member of the active staff at Etobicoke General Hospital, and a staff member at the Hamilton General Hospital.

If you're not a CDA member, here's what you missed in the November/December issue of Communiqué ...

CDA Appears Before Finance Committee

Health Canada Releases Report on Mercury Exposure

Dental Benefits Issues Committee Develops Action Plan

Managed Care — What Does It Really Mean?

Competition In Dentistry: Where Will It All End?

CDA members receive *Communiqué,* in the language of their choice, six times per year as a benefit of membership. For more information, or to join your national association, call: 1 (800) 267-6354.

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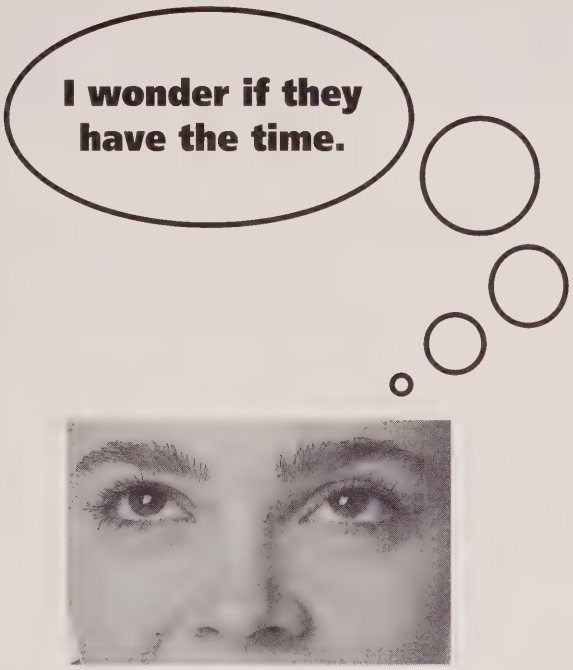

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SELF-LEARNING SELF-ASSESSMENT

The SLSA Program is published as a monthly feature in the *Journal of the Canadian Dental Association* as a resource for dentists wishing to enhance their dental knowledge and expertise. It is intended as a vehicle for self-learning and self-assessment. The program is based on a series of 40 questions, answers, rationales, and references, followed by an annual 15-question quiz. The 1995-96 quiz will appear in the June 1996 issue of the *Journal.* Answers to the quiz will be published in the August 1996 issue. Dentists who complete the quiz may be eligible to receive continuing education points, and their names will be forwarded to their provincial licensing bodies for consideration.

Questions 16 through 20 are a repeat of the questions that appeared in the December issue of the *Journal* accompanied with correct answers, the rationales and specific references. Question 21 through 25 are new questions — watch for their answers and rationales next month. Keep all copies of the *Journal* so you can correctly respond to the June 1996 quiz.

QUESTION 16

Osteoporosis is a condition which
(1) is found only in post menopausal women.
(2) is asymptomatic initially.
(3) predisposes to fracture of skeletal bones.
(4) causes loss of teeth because of caries.
(5) accelerates ridge resorption in the edentulous mouth.

A. (1) (4) (5)
B. (2) (3) (5)
C. (1) (2) (3)
D. All of the above.

ANSWER: B

RATIONALE:

Osteoporosis is characterized by low bone mass and deterioration of the bone architecture leading to increased bone fragility and fracture. It is referred to as the "silent disease" — symptomless early and occurring most frequently but not exclusively in post-menopausal women. Recent work using improved diagnostic methods has shown that oral bone loss accompanies osteoporosis to cause ridge resorption as well as alveolar bone height reduction with subsequent tooth loss.

Efforts to prevent oral bone loss are directed at plaque control and, where suspected, referral of patients for appropriate systemic management with estrogen replacement therapy and calcium supplementation. A patient who is edentulous requires careful and frequent scrutiny by the dentist to check that dentures fit and occlusion is satisfactory to prevent accelerated ridge resorption.

REFERENCES:

(1) Jeffcoat, M.K. and Chestnut, C.H. Systemic osteoporosis and oral bone loss: evidence shows increased risk factors. *JADA* 124:49-53, 1993.
(2) *The Oral Care Report Vol. 4.* Ed. G. Nikiforuk, September 1994.

QUESTION 17

Penicillin G, Amoxicillin, Ampicillin and Penicillin V are all penicillin antibiotics. Penicillin V is the drug of choice for empirical treatment of odontogenic infections because it
(1) is highly active against the major pathogens in odontogenic infections.
(2) has low cost.
(3) is stable in an acid environment.
(4) does not impair oral contraceptive efficacy.
(5) causes less sensitivity reaction.

A. (1) and (3)
B. (1) (2) (3)
C. (1) (2) (3) (4)
D. All of the above.

ANSWER: B

RATIONALE:

Penicillin V (phenoxymethyl penicillin) was one of the first penicillins discovered and remains the best for odontogenic infection control. When

taken orally, it reaches a peak serum level within 1-2 hours after ingestion. It is a low cost antibiotic which adds to its benefit.

Penicillin V is stable in the acid environment of the stomach as opposed to Penicillin G, which is inactivated to allow only 30 per cent absorption of the dose given.

Although gastrointestinal upset may accompany the penicillins, in general, this is most obvious with the use of ampicillin. Any of the penicillins may impair oral contraceptive efficacy and practitioners should warn patients of this.

Amoxicillin is not indicated for routine odontogenic infections. Compared with Penicillin V it has less activity against gram positive cocci, but because of increased efficacy against gram negative cocci and bacilli, is the advocated penicillin in prophylaxis against endocarditis.

The major adverse effect of all penicillins is a hypersensitivity reaction which can range from a rash with urticaria to severe anaphylactic shock.

REFERENCES:

(1) Karlowsky, J., Ferguson, J. and Zhamed, G. A review of commonly prescribed oral antibiotics in general dentistry. *J Can Dent Assoc* 59:292-299, 1993.

QUESTION 18

When fissure sealants are placed inadvertently over existing caries

(1) the sealant is quickly lost.
(2) the microorganisms present proliferate.
(3) the microorganisms present decrease in number.
(4) caries progresses to involve the interproximal surfaces.
(5) caries progression is considerably reduced.

A. (1) only
B. (2) and (4)
C. (3) and (5)
D. (1) (2) (4)

ANSWER: C

RATIONALE:

Since the sealant has been acid etched to the tooth surface, the peripheral resin has an adequate seal which prevents percolation. Organisms, therefore, decrease in viability and caries progression is prevented. Because the lesion in the fissure base is small and the area of acid etched enamel is extensive by comparison, the retention of the sealant is not affected.

REFERENCES:

(1) Waggoner, W.F. Managing occlusal surfaces of young permanent molars. *JADA* 122:72, 1991.
(2) Swift, E. The effect of sealants on dental caries: A review. *JADA* 116:700, 1988.

QUESTION 19

A tooth requires surgical lengthening for a full crown restoration. This may result in

A. pulpal complications.
B. margin and contour problems.
C. root caries.
D. problems with esthetics.
E. All of the above.

ANSWER: E

RATIONALE:

Surgically lengthened clinical crowns can lead to pulpal complications during crown reduction with occasional need even to extirpate vital pulps. The surgical treatment invariably extends into the concave surfaces of the roots which causes difficulty in plaque control and this may lead to root caries. Additional considerations are the placement of the margin and the shaping of the root portion of the crown for esthetics. Patient cooperation with rigorous plaque control using suitable interproximal cleansing aids is essential for a reasonable prognosis. Since periodontal support is reduced, this must also be taken into consideration. Although surgical lengthening of clinical crowns gives immediate results, forced eruption of a tooth, especially in the anterior region where esthetics is important, can provide the clinician an alternative method. It does, however, take time to move the tooth into an appropriate position. The same precautions regarding pulp exposure and concave surfaces on roots giving plaque control problems still require consideration.

REFERENCES:

(1) Marzouk, M.A., Simonton, A.L. and Gross, R.D. *Operative dentistry — Modern concepts and practice.* St. Louis: Ishiyaku Euro, Chapter 28, 1985.
(2) Shillinburg, H.T., Hobo, S. and Whitsett, L.D. *Fundamentals of fixed prosthodontics.* 2nd ed. Chicago: Quintessence Publishing Co., Inc., Chapters 1 and 7, 1981.
(3) Ivey, D.W., Calhone, R.L. and Kemp, W.B. Orthodontic extrusion: its use in restorative dentistry. *J Prosth Dent* 43:401-407, 1980.

QUESTION 20

Patients with implants can exhibit peri-implant inflammation which is

A. the same as periodontitis in the natural dentition.
B. caused by bio-incompatibility of the implant.
C. due to the rough porous surface of the metal.
D. plaque induced.

ANSWER: D

RATIONALE:

The control of soft tissue inflammation around an implant is essential for long-term implant success. Little is known about the difference between development of periodontitis of the natural teeth and the loss of osseointegration around implants and their failure.

The inflammation seen in the soft tissue around the implant would appear to be often related to bacterial plaques. Implant materials are bio-compatible but the microscopic rough porous surface may harbour plaques and their organisms to produce soft tissue inflammation.

To offset these difficulties, patients should have a regular regimen of maintenance hygiene visits with evaluation of bone levels from original base line data. Gentle probing with fixed reference points on the abutments to allow for comparative recording is also recommended.

Patient instruction on cleaning with brushes, floss, and other aids as well as chlorhexidine gluconate mouthwash will reduce the plaque irritants.

Albrektsson et al (1986), recognized researchers in the implant field, have proposed the following success criteria:

1) That an individual, unattached implant is immobile when tested clinically.
2) That a radiograph does not demonstrate any evidence of peri-implant radiolucency.
3) That vertical bone loss be less than 0.2 mm annually following the implant's first year of service.
4) That individual implant performance be characterized by an absence of signs and symptoms such as pain, infections, neuropathies, paresthesia or violation of the mandibular canal.

Although other criteria for success have been published, the above constitutes the basis upon which success has to be measured.

REFERENCES:

(1) Hillenburg, K.L. et al. Peri-implant inflammation. *Pract Periodont Aesthetic Dent* 3:11-16, 1992.
(2) Albrektsson, T., and Sennerby, L. State of the Art in Oral Implants. *J Clin Periodontol* 18:474-481, 1991.
(3) Albrektsson, T., Zarb, G., Worthington, P. and Eriksson, R.A. The long-term efficacy of currently used dental implants: a review of proposed criteria of success. *Int J Oral Maxillofac Implants* 1:11-25, 1986.
(4) *The Oral Care Report Vol. 5* Ed. G.Nikiforuk, March 1995.

The SLSA program is a resource and service, directed to the dental profession and the licensing authorities, which is intended to help dentists achieve and maintain the high levels of expertise and competence identified by Canadian dental licensing authorities. All questions and other material are based on current, referenced literature.

Financial support for the program has been provided by A-dec, Colgate, the Fowler-Pearce Partnership (Nesbitt Burns), Nobelpharma, and Sci-Can.

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The views expressed in the questions, answers, rationales, reversal questions and reversal answers of the SLSA program are not necessarily those of the Canadian Dental Association or its related organizations.

THIS MONTH'S FIVE NEW QUESTIONS

QUESTION 21

In non-vital teeth with periapical radiolucencies calcium hydroxide will

(1) act as an anti-microbial agent.
(2) suppress cell enzyme systems.
(3) alter the pH of the adjacent tissues.
(4) promote fibroblast proliferation, migration and healing.

CDA encourages Canadian dental licensing authorities to recognize the SLSA Program as an appropriate and acceptable resource for dentists seeking to earn the continuing education credits required for the maintenance of licensure.

Currently, all 10 provincial licensing bodies — British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland — recognize the SLSA program for continuing education credits.

A. (1) and (2)
B. (1) (3) (4)
C. (2) and (4)
D. All of the above.

QUESTION 22

Which of the following antimicrobial agents are used in the management of periodontal pockets by subgingival irrigation?

A. Provido-iodine.
B. Chlorhexidine.
C. Cetylpyridine.
D. All of the above.

QUESTION 23

Which of the following statement(s) is/are true?
(1) Impacted mandibular third molars should be removed to prevent incisor crowding.
(2) The mean age for eruption of mandibular third molars is 16 years.
(3) Crowding of mandibular incisors can continue beyond 50 years.
(4) Patients with mandibular anterior spacing can develop incisor crowding in middle age.
(5) Mandibular arch constriction can continue beyond age 50.

A. (1) and (2)
B. (3) (4) (5)
C. (1) (3) (4) (5)
D. All of the above.

QUESTION 24

Pharmacokinetic changes occur with aging which affect absorption, distribution, metabolism and excretion of drugs. Which of the following are correct?
(1) Absorption is altered by a decrease in the gastric pH.
(2) Distribution is altered by decrease in the total body fat.
(3) Metabolism is decreased by a reduced liver mass.
(4) Excretion is reduced because of lessened renal blood flow.

A. (1) and (2)
B. (2) and (3)
C. (3) and (4)
D. All of the above.

QUESTION 25

In deep cavities when an amalgam restoration is planned, a cement base must be used to
(1) provide insulation against hot and cold stimuli.
(2) prevent microleakage.
(3) decrease post-operative sensitivity.
(4) increase strength and longevity of the amalgam.

A. (1) only
B. (1) and (2)
C. (1) (2) (3)
D. All of the above.
E. None of the above.

(Answers to questions 21-25 will appear in next month's *Journal*.)

Funding for the SLSA Program has been provided by:

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NEWS UPDATE

CDA Appears Before Finance Committee

Dr. James Brookfield, president of CDA.

CDA appeared before the House of Commons Standing Committee On Finance November 22 to state dentistry's case against the taxation of employer-sponsored dental plan premiums.

In his presentation to the committee, CDA president Dr. James Brookfield stated that a tax on dental and health benefit premiums would be "bad health policy" and "ill-conceived economic policy" that would "represent a giant step backward in this government's commitment to fair and equitable treatment of Canadians ...

"Last year, members of Parliament received letters and calls from hundreds of thousands of Canadians," said Dr. Brookfield. "This year, if the taxation of health benefits is still being considered by this government, that heartfelt protest will be merely the tip of the iceberg."

Dr. Brookfield also addressed the equity issue, which Finance Minister Paul Martin raised as a concern last year prior to the introduction of his 1995 budget.

Based on research conducted by the Action Plan Committee for Fair and Supportable Tax Treatment for Health and Dental Programs, which CDA joined early last year, Dr. Brookfield informed the committee that 25.6 million Canadians, or 87.7 per cent of the population, are covered by some form of government or private supplementary health plan, and that only 3.6 million Canadians have no coverage.

CDA is calling on Mr. Martin to maintain the current tax-free status of dental benefit plans until the government has conducted a full and comprehensive review of the tax system, and how it impacts on all aspects of Canada's health-care delivery system. ■

MP-Dentist Contact Program Launched

CDA's MP-Dentist Contact Program binder was sent to participating dentists in December.

Dentistry's campaign against the taxation of employer-sponsored dental plans took a new twist October 27, when CDA launched its new MP-Dentist Contact program.

Intended as a mechanism to establish an open line of communication between dentistry and government, the program will ultimately involve more than 295 contact dentists, as well as CDA's board of governors and executive council.

The program's immediate goal is to reinforce the no-tax message that CDA and dentistry delivered to government last year through the "Enough is Enough" campaign. To that end, participating dentists have been provided with a comprehensive program binder containing detailed instructions on how to set up a meeting with their MP, as well as the core messages that they should deliver to government on CDA's behalf.

All MP-Contact dentists were to have met one-on-one with their local MP by the end of this month, prior to the delivery of Finance Minister Paul Martin's 1996 budget. CDA has decided to take the issue to the public level, however, by initiating a full-scale petition against the taxation of employer-sponsored dental plans. This may be coupled with a new television and print advertising campaign, based on last year's "Enough is Enough" theme.

Over the long term, the MP-Dentist Contact Program will be used to communicate with government on a wide range of issues of concern to dentistry, as well as to enhance CDA's ability to track the support, of both government and opposition MPs, for dentistry's position on key issues. ■

CDA Introduces New Corporate Image

Miss Linda Teteruck, CDA's director of communications.

If it took you a moment to recognize this month's *CDA Journal*, take heart.

The *Journal's* cover, masthead and contents pages all changed dramatically in January, when CDA introduced its new corporate image.

Developed for CDA by a leading Ottawa designer, the new image is part of a comprehensive graphic standards program that will be ap-

CDA Convenes International Panel Of Experts To Analyze Mercury Exposure Report

An international panel of experts was convened by CDA December 11 to analyze a recently-released Health Canada report on mercury exposure.

Entitled "Assessment of Mercury Exposure and Risks From Dental Amalgam," the report was prepared for Health Canada by Dr. Mark Richardson. It proposes a tolerable daily intake (TDI) for the mercury vapor released by dental amalgam restorations, and estimates the number of fillings that would likely cause this TDI to be exceeded in individuals of various ages.

The TDI proposed in the report is 0.014 µg per day. Based on this TDI, the report presents two models for the number of dental amalgams that can be safely placed in a patient's mouth. One, based on research by Olsson and Bergman, suggests that no amalgam restorations can be placed in toddlers or children without exceeding the TDI, and that a maximum of two fillings can be placed in teens, adults or seniors. The other model, based on research by Richardson et al, suggests that a maximum of one dental amalgam can be placed safely in toddlers and children, three in teenagers, and four in adults and seniors.

The report, which is based entirely on a review of the literature, and did not involve any new research, also suggests that the mercury released from dental amalgams accounts for 50 per cent of total mercury exposure in adults.

International panel of experts meets at CDA headquarters in Ottawa (l. to r.): Drs. C. Siew (U.S.), B. Elley (U.K.), K.S. Larsson (Sweden), A. Berglund (Sweden), D. Jones (Can.), Mr. B Henderson (Can.), and Dr. P.L. Fan (U.S.).

CDA's panel included both Drs. Larsson and Berglund, as well as experts from Canada, the United States and Britain. A summary of the panel's findings will be published in a future issue of *Communiqué*.

Full details of the contents of the Health Canada report were provided to CDA members December 4 in a special President's Letter.

"The Richardson report is a laudable attempt to review the current literature and establish a total daily intake within which the contribution of dental amalgam to mercury exposure can be assessed," wrote CDA president Dr. James Brookfield. "The CDA welcomes this initiative. However, a great deal hinges upon many uncertainties in both the data and the interpretation of the data. Serious and thorough study of the methodology, calculations and assumptions will be required to assess the validity of the conclusions presented."

In addition to the President's Letter, CDA members received a copy of the executive summary of the Health Canada report, an outline of relevant research findings that appear to contradict the report, and a series of questions and answers that should help providers to respond to patient concerns about dental amalgam.

Health Canada's report does not constitute government policy. The department has struck a stakeholder committee, which includes representatives from CDA, to review the report and make recommendations. Although these recommendations will not be binding, Health Canada will consider them when it develops its new position statement on the safety of dental amalgam, which will likely be released early in 1996. ■

plied to all CDA publications and communications materials over the next six months.

By June of this year, the side bar and shadow-boxed logo motif will be incorporated into everything from the cover of CDA's members-only *Communiqué* to the design of its envelopes and letterhead. The intent is to increase recognition of CDA by its various publics, and to ensure that its corporate communications reflect the association and its goals in a consistent and positive manner.

"Some of the market research we've done, particularly in Ontario, indicated that dentists didn't really have a clear perception of what CDA is all about," said director of communications Miss Linda Teteruck. "We felt that it was important for us to enhance our corporate image, both to reflect CDA's proactive, modern approach to issues management, and also to ensure that dentists across Canada are aware of what their national association is doing on their behalf." ■

North York Launches Tooth Wiz

North York's public health department has unveiled an innova-

CDA/Dentsply Presents 25th Student Clinician Program

The Silver Anniversary of the CDA/Dentsply Student Clinician Program was held in conjunction with the 1995 CDA Convention last August.

An annual event, the table clinic competition is sponsored by Dentsply Canada through a special grant to the Dentistry Canada Fund. Students who place first in their school's individual student clinician program are provided with an expense-paid trip to present their clinic during the CDA Convention and attend a special awards dinner.

The 1995 program featured nine student table clinics. Mr. Peter C. Fritz of the University of Toronto claimed first place for his clinic on "Bone morphogenetic protein induced osteogenesis in vitro," while Mr. Imad Salloum of the University of Western Ontario earned second place for his clinic on "The effects of extracellular nucleotides on gene expression in skeletal/tissues." ■

Participants and sponsors of the 25th CDA/Dentsply Student Clinician Program. Seated (l. to r.) Mr. Donald R. Nixdorf, University of Alberta; Dr. Bryun Sigfstead, then CDA president; Ms. Carolyn Rizkalla, University of Manitoba; Mr. George R. Rhodes, Dentsply's vice president; and Mr. Charles Chartrand, University of Montreal. Standing (l. to r.): Mr. Omar Chahal, McGill University; Mr. Scott B. Stewart, University of Saskatchewan; Mr. Peter C. Fritz, University of Toronto; Mr. Imad Salloum, University of Western Ontario; Mr. Randall Barker, University of British Columbia; Mr. M. Bruno Girard, Laval University; and Mr. Kevin R. Burns, Dalhousie University.

tive computer program designed to teach school-age children about dental health in a high-tech way.

Introduced November 14, Tooth Wiz is a multi-media, interactive computer program that uses motion video and sound to instruct young children on how to take care of their teeth. The program uses games to teach kids about oral health, sings them songs, and gives them answers at the touch of a finger.

Tooth Wiz was conceived by Debbie Zanetti, who is in charge of dental education for North York's public health department, and was developed into a software package as part of a school project taken on by a class at North York's A.Y. Jackson secondary school.

Sherali Rahim, the 17-year-old student who came up with the winning design for Tooth Wiz, created the program using state of the art computer techniques that would appeal to children under eight years of age. It took Rahim about three months and 300 hours of work to design a program that dental educators say sets a new standard for teaching children about oral hygiene.

The Tooth Wiz software program will be provided to North York schools by the public health department at no charge, and sold to other schools or agencies at a minimal cost. Agencies interested in obtaining a copy of Tooth Wiz can contact Debbie Zanetti at (416) 395-7627. ■

New Act in B.C. Protects Children

Starting January 1, 1996, all new registrants of the College of Dental Surgeons of British Columbia, both dentists and certified dental assistants, will be required to submit to a criminal record check under the B.C. Criminal Records Review Act (CRRA).

The CRRA is designed to help protect children from physical and sexual abuse from health-care workers and other individuals who have unsupervised access to children.

According to a news account in the November issue of the college's *Bulletin*, in April 1997, when the legislation comes into full force for all currently licensed registrants, the B.C. College will be required to contact every licensed dentist and certified dental assistant in the province to obtain written authorization for a criminal record check.

Dentists, as employers, will have to act even sooner. As of October 1, 1996, they will be required to obtain written authorization for a criminal record check to be done from their unlicensed dental personnel. ■

A Call to Dentists and Dental Students of Aboriginal Ancestry

A group of aboriginal students and graduates from the faculty of dentistry at the University of Manitoba hope to establish a new professional association for native dentists.

Their goal is to "form a professional association similar to the American Association of Indian Physicians (AAIP) or its counterpart

Dental Health Centre Granted Charitable Status

The Dr. Helene Shingles Dental Health Centre was recently granted the status of a charitable organization by Revenue Canada.

Founded in 1994 by Dr. Shingles and concerned citizens in Sarnia, Ontario, the Dental Health Centre's mission is to promote communication and interaction among practitioners, policy makers, seniors and interested members of the general public concerning oro-dental health care for seniors and the homebound.

Dr. Shingles, who confesses she is now closer to 80 than 70, became concerned with the dental health of Sarnia district seniors in 1979 — after she had retired from many years of private practice. On her own initiative, working as a volunteer, she conducted a survey of 950 seniors and found that 95 per cent required almost immediate dental care. Since then, without charge, she has provided dental treatment to the institutionalized and homebound.

"The elderly are often forgotten when it comes to appropriate and timely dental care, and they suffer traumatic oro-dental conditions for years," said Dr. Shingles.

The Dental Health Centre is Dr. Shingles's answer to the problem. Supported by donations and gifts — and she willingly accepts both — her current goal is to ensure that the voluntary dental program she initiated years ago will be sustained long after she is unable to participate. More than that, she hopes the success of her Sarnia seniors' initiative will challenge retired dentists in other communities to start similar programs.

"I hope my colleagues have not retired in the usual sense, but continue to use their talent and knowledge and energy for the benefit of the community ... we want to keep our seniors "living" not just "alive." "

Since 1982, when she was named to the Mayor's Honor List in Sarnia, Dr. Shingles has received numerous awards for her community concerns. Among her most recent awards of recognition are the Canada Volunteer Award Certificate of Merit and the Ontario Medal for Good Citizenship.

During the CDA Convention in Ottawa last August, Dr. Shingles received the Canadian Dental Association's highest award, honorary membership. ■

Dr. Helene Shingles accepted honorary membership in CDA during the 1995 CDA Convention in Ottawa.

in Canada, the Native Physicians Association in Canada (NPAC)."

The group wishes to establish contact with their aboriginal counterparts in other Canadian provinces and territories. Interested parties are asked to contact Dr. Mary Jane McCallum at: 517 Bower Blvd., Winnipeg, Manitoba R3P 0L7. ■

USC&LS Updated

Effective January 1, 1996, the term "prophylaxis" will no longer appear in any CDA approved coding related to the Uniform System of Codes and List of Services (USC&LS).

CDA, with the support and approval of its provincial corporate bodies, will eliminate the code for a prophylaxis and replace it with two new codes, one for polishing and one for scaling.

The move is an attempt to more accurately define the actual treatment being rendered in the dental office, and to allow fees for polishing and scaling to be based on time units. Under the former codes, the definition of prophylaxis incorporated both of these procedures.

Although the addition of separate polishing and scaling codes to the USC&LS will have no significant impact on dental plan coverage, it will now be necessary for plan administrators to incorporate these changes into their interpretation of existing contracts that were still in effect as of January 1, as well as into the wording of new contracts.

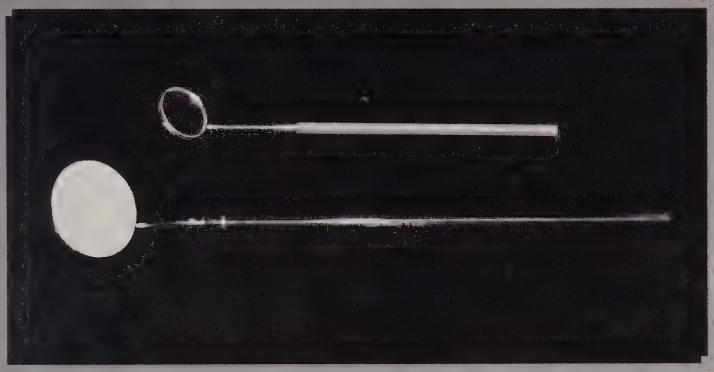
The term scaling, as well as the code for this treatment, is not restricted to preventive services. Scaling continues to be recognized as an important aspect of periodontal treatment. The same scaling code will now be used for preventive and periodontal treatment, however. ■

ERRATUM

A paragraph printed in CDA's 1994-95 *Annual Review* may have been misleading. In the section of the review entitled "The Bottom Line," it is implied that much of the approximately $500,000 combined CDAnet-CDAnet*plus* program deficit was related to the legal costs incurred to bring MSA and CU & C on line in British Columbia. In fact, only $30,000 of this deficit was directly related to actual "legal" costs. The total cost incurred to bring these two carriers into the CDAnet system was $163,295, however, which accounts for 33 per cent of combined CDAnet-CDAnet*plus* deficit. ■

WHAT'S IT?

This very over-sized mirror/reflector (photographed beside a normal operating mirror for comparison) was sent to the *Journal* by Dr. John Peters of Goderich, Ontario. We think we can identify it as part of the armamentarium used in taking X-rays many years ago. Any reader who can shed light on the mirror/reflector's actual use and purpose is asked to contact Dr. Ralph Crawford c/o Canadian Dental Association, 1815 Alta Vista Dr., Ottawa, Ont. K1G 3Y6. ■



APPOINTMENTS

CAE Elects New President

Dr. Terry Smorang

Dr. Terry Smorang has been elected president of the Canadian Association of Endodontists (CAE).

Dr. Smorang, who maintains a private endodontic practice in Calgary, Alberta, received his DMD from the University of Manitoba in 1975 and completed a certificate program in endodontics at the University of Southern California in 1982.

Serving with Dr. Smorang on the CAE executive are president-elect, Dr. Calvin Pike of Kitchener, Ontario; treasurer, Dr. Raymond Greenfeld, Richmond, B.C.; executive-secretary, Dr. Carl Hawrish, Edmonton, Alberta; constitution and by-laws, Dr. Richard Hunter, Toronto, Ontario; and past president, Dr. Paul Teplitsky of Saskatoon, Saskatchewan. ■

APC Elects New Officers

Dr. Morley S. Rubinoff

Dr. Morley Rubinoff, a private practitioner from Willowdale, Ontario, has been elected president of the Association of Prosthodontists of Canada (APC).

Dr. Rubinoff is the immediate past-president of the Association of Prosthodontists of Ontario and the current president of the Canadian Dental Protective Association (CDPA). He received his DDS from the University of Toronto in 1974, and his certification in prosthodontics from the University of New York at Buffalo in 1984.

Joining him on the APC executive for 1995-96 are: Drs. Benoit Soucy, president-elect; Don Kramer, vice-president; Michael Moscovitch, secretary-treasurer; and Brian Kucey, past-president. ■

ERRATUM

A typographical error that appeared in a letter to the editor published on page 1,024 of the December issue of the *Journal* may have been misleading. The letter from Dr. Robert A. Matthews about toluidine blue staining should have read: "Toluidine blue staining provides an opportunity to identify asymptomatic oral cancer at a very early stage ..." It actually read: "Toluidine blue staining provides an opportunity to identify a symptomatic oral cancer at a very early stage ... " The *Journal* apologizes for any confusion this may have caused.

OBITUARIES

Bannister, Dr. L.G.: A 1937 graduate from the University of Toronto's faculty of dentistry, Dr. Bannister was a life member of the Canadian Dental Association. He died in May 1995.

Box, Dr. Keith F.: Died August 13, 1995. Dr. Box graduated from the faculty of dentistry at the University of Toronto in 1950.

Lyn, Dr. Herman J.: Died on August 26, 1995. Dr. Herman received his dental degree from Loyola University School of Dentistry in Chicago, Ill. in 1948. He was a life member of the Canadian Dental Association.

Nordstrom, Dr. Birgit: Born and raised in Sweden, Dr. Nordstrom was a 1956 graduate of the faculty of dentistry at McGill University. She practised in Montreal for 10 years before moving to Australia where she died in September 1995.

MacLean, Dr. Donald F.: A 1979 graduate from the faculty of dentistry at McGill University, he died September 10, 1995.

Messer, Dr. James: He received his dental education in Scotland and emigrated to Canada in 1964. He was appointed dental coordinator for the International Grenfell Association (IGA) in St. Anthony, Newfoundland, in 1976. When the Grenfell Regional Health Services succeeded the IGA in 1981, Dr. Messer was appointed chief of dental services, a position he held until

1994 when he relocated to St. John's. An accomplished painter, some of his works depicting various aircraft that fly in Northern Newfoundland and Labrador earned honorable mention from the National Aviation Museum. He died in St. John's on September 5, 1995.

Piderman, Dr. R.J.: Retired from dentistry since 1987, Dr. Piderman was living in Vancouver, B.C. He received his dental degree in 1949 from the University of Oregon. He died in November of last year.

Wu, Dr. (Dick) Kwok Ying: Born in Hong Kong, Dr. Wu was a 1977 graduate from the University of Manitoba's faculty of dentistry. He died September 16 at the age of 47.

DID YOU KNOW?

It's About Your Fees

It's unwise to pay too much,
but it's worse to pay too little.
When you pay too much,
You lose a little money ...
that is all.

When you pay too little,
you sometimes lose everything,
because the thing you bought
was incapable of doing
the thing it was bought to do.

The common law
of business balance
prohibits paying a little
and getting a lot ...
it can't be done.

If you deal with the lowest bidder,
it is well to add something
for the risk you run.
And if you do that,
you will have enough to pay
for the something better.

(John Ruskin, 1819-1900)

LIBRARY PACKAGE

This month's library package is **PROVISIONAL RESTORATIONS.** This package contains current articles, obtained by using Medline, and is available to all CDA members for $5, plus applicable taxes. To order a copy, please call the CDA Resource Centre at: 1 (800) 267-6354, ext. 223.

NEW ACQUISITIONS

The following books have been added to our library collection. CDA members can borrow them for a period of one month, at a cost of $5 each, plus applicable taxes — this includes return postage.

Requests can now be sent to the library via Internet e-mail: cdalib@magi.com

APPLETON & LANGE'S REVIEW OF DENTAL HYGIENE / Barnes, Caren M.; Waring, Margaret B. — Norwalk, CT: Appleton & Lange, 1994.

ATLAS OF ORTHODONTICS : PRINCIPLES AND CLINICAL APPLICATIONS / Viazis, Anthony D. — Philadelphia, PA: Saunders, 1993.

COMPLICATIONS IN HEAD AND NECK SURGERY / Krespi, Yosef P.; Ossoff, Robert H. — Philadelphia, PA: Saunders, 1993.

ELEMENTS OF DENTAL MATERIALS FOR DENTAL HYGIENISTS AND DENTAL ASSISTANTS / Phillips, Ralph W.; Moore, B. Keith — Philadelphia, PA: Saunders, 1994.

ESSENTIALS OF DENTAL ASSISTING / Ehrlich, Ann; Torres, Hazel O. — Philadelphia, PA: Saunders, 1992.

ESTHETICS OF ANTERIOR FIXED PROSTHODONTICS / Chiche, Gerard; Pinault, Alain — Chicago, IL: Quintessence, 1994.

ILLUSTRATED ANATOMY OF THE HEAD AND NECK / Fehrenbach, Margaret J.; Herring, Susan W. — Philadelphia, PA: Saunders, 1996.

ORAL BIOLOGY / Van Rensburg, B.G. Jansen — Chicago, IL: Quintessence, 1995.

ORAL IMPLANTOLOGY: BASICS — ITI HOLLOW CYLINDER SYSTEM / Schroeder, Andre; Sutter, Franz; Krekeler, Gisbert — New York, NY: Thieme Medical Publishers, 1991.

THE PERIODONTIC SYLLABUS / Fedi, Peter F., ed.; Vernino, Arthur R., ed. — Baltimore, MD: Williams & Wilkins, 1995.

RADIOGRAPHIC CEPHALOMETRY FROM BASICS TO VIDEOIMAGING / Jacobson, Alexander, ed. — Chicago, IL: Quintessence, 1995.

RADIOGRAPHIC IMAGING FOR DENTAL AUXILIARIES / Miles, Dale A.; Van Dis, Margot L.; Jensen, Catherine; Ferritti, Anne Bruno — Philadelphia, PA: Saunders, 1993.

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CDSPI

An RRSP Checklist for Success

With the February 29 contribution deadline for the 1995 RRSP year just around the corner, you may find yourself confused by the many investment fund options available. You may know that the CDA RSP is a retirement plan offered solely to dentists, their families and staff as a benefit of association membership, but be unsure how to use an RRSP to your greatest advantage.

But take heart, successful RRSP investing in professionally managed funds doesn't have to be difficult, if you keep the following "rules" for success in mind.

Have a Long-Term Plan

Your RRSP investment choices shouldn't be made in a vacuum. You need to map out a long-term investment plan based on your personal needs.

If you're feeling overwhelmed by the sheer number of funds available, your initial strategy may be to contribute largely to a balanced fund which contains a mix of income and growth holdings. Your fund manager will determine the most promising mix of investments for the fund as markets evolve. If you are a more sophisticated investor, you may choose a mix of income and growth holdings suited to your personal circumstances by investing in a variety of funds. (For help with this, call CDSPI for a copy of the *CDA RSP Planner*.) If you have developed a solid understanding of investment markets, and you follow economic cycles and trends closely, you may wish to apply some well-known investment principles when making your choices.

Stick to Your Plan

Advertisements boasting sensational one-year performance figures can tempt you to jettison your plan in favor of a "hot" new prospect. The trouble is, funds and investment classes which are "hot" one year tend not to be the next because of the cyclical nature of economic conditions. So avoid the tendency to impulse shop.

For instance, if you have previously determined the percentage of your assets which should be in stocks and bonds, you can use your 1995 contribution to maintain the ratio between the two. If one of these asset classes has outperformed the other and upsets the balance of your portfolio, invest in the under-performer (which likely has the most potential for greater returns in the near future) to re-establish the ratio.

Choose a Secure RRSP

Security is of prime importance in a retirement investment plan. Selecting a well-established RRSP is a good idea, but you should also take a good look at the types of funds available. Some mutual funds have risk levels that aren't suitable for retirement investing. You can also gain extra security by selecting segregated funds such as those in the CDA RSP, since these can offer advantages not offered by mutual funds, such as protection from creditors.

Look for Long-Term Performance

Retirement investing is a long-term proposition, so five-year and 10-year fund performance figures are the important ones to consider. Of course, past performance doesn't necessarily indicate future results, so take a good look at the long-term reputation of the fund manager as well. (The CDA RSP offers both strong past performance and a 37-year reputation for excellence.)

Take Into Account The Effect Of Fees

Although the CDA RSP has no sales or service fees, and very low management fees, many other plans charge a variety of fees. Such fees (such as front- or back-end "loads" and transfer fees) can significantly decrease the real return your money earns.

Balance Risk and Reward

Usually, the more risk associated with an investment, the greater its potential for return. Sometimes the additional return from a higher-risk asset seems small, so investors opt for only more secure, lower-returning investments. However, even small differences in your plan's overall rate of return can have a major effect on your final retirement total, thanks to many years of compounding. Higher risk investments such as stocks, which can be volatile over short periods, tend to demonstrate better growth over long periods.

One option is to diversify your portfolio with funds that range from low risk/low return to high risk/high return. This strategy can produce above-average long-term returns by going for steady gains while minimizing losses. The performance ups and downs of the various funds tend to occur at different times, smoothing the performance of your entire portfolio.

Consider Your Age and Financial Circumstances

Usually, the younger you are, the more of your RRSP contribution you should put into higher risk, growth investments. If these investments go down in value, they will have a longer time to recover, and in the long term they will likely earn more than lower

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risk investments. On the flip side, if you are older, you should move more of your RRSP investments into safer, income-producing funds, unless you have significant other resources devoted to funding your retirement.

Contribute the Maximum

Although it may be difficult, you should always try to make your maximum possible annual contribution to your RRSP. If you don't have the cash to make the maximum contribution for 1995, you should consider taking out a loan to do so. The tax rebate you receive in the spring can be directed to helping pay down the loan. The government allows you to "carry-forward" unused contribution amounts for up to seven years for future use. However, if you postpone your contribution you may find that you never catch up.

Don't Forget Your Spouse

Many plans such as the CDA RSP allow you to set up a spousal RRSP to which you can contribute. Although your total contribution to your own fund and your spouse's can still only total the maximum specified for your income, having a spousal plan will allow money to be drawn from two income streams at retirement rather than just one. Since the two income streams will hopefully be taxed at lower levels, you and your spouse will have a lower total tax bill.

Think Ahead

Although you may be making a lump sum contribution now for the 1995 year, you should also start working toward your 1996 contribution. Making that contribution earlier can make a substantial difference in earnings over the years. You may want to consider making monthly contributions, since these are often easier to handle and take advantage of "dollar cost averaging" — an automatic technique which results in you purchasing, on average, more fund units at lower costs. The CDA RSP offers a convenient pre-authorized chequing plan for monthly investing.

If you have questions about RRSP investing, call CDSPI toll-free at 1 (800) 561-9401, extension 253, 255 or 256 and ask to speak to an investment administrator. ■

CDA RETIREMENT SAVINGS PLAN

✔ Check Out Superior Investment Performance

CDA Fund Performance (for periods ending November 30, 1995)†
(Checks indicate Superior Performance Compared to Industry Averages*)

CDA Fund	1 Year		3 Year		5 Year		10 Year	
	CDA	Other*	CDA	Other*	CDA	Other*	CDA	Other*
Aggressive Equity	**5.7%**	19.2%	n/a		n/a		n/a	
Common Stock	**13.3%**	13.6%	**12.8%**	13.0%	**10.5%**	10.9%	✔ **9.4%**	7.9%
Balanced	✔ **14.9%**	14.8%	**9.5%**	10.9%	**10.1%**	10.7%	✔ **9.2%**	8.3%
Bond & Mortgage	**15.7%**	17.1%	✔ **9.2%**	9.1%	✔ **11.0%**	10.8%	✔ **10.3%**	10.0%
Money Market	✔ **7.1%**	6.2%	✔ **6.0%**	5.1%	✔ **6.7%**	6.2%	✔ **8.3%**	7.9%
International Equity	✔ **10.2%**	7.1%	n/a		n/a		n/a	
European	✔ **16.0%**	10.0%	n/a		n/a		n/a	
Pacific Basin	✔ **10.8%**	-5.9%	n/a		n/a		n/a	
Emerging Markets	✔ **-16.4%**	-21.5%	n/a		n/a		n/a	

† *CDA figures indicate annual compound rate of return with all fees deducted. The figures are historic rates based on past performance and are not necessarily indicative of future performance.*

* *Comparison performance figures are Globe and Mail averages for the range of similar funds offered in the marketplace before sales charges, as published in the December 21, 1995 issue.*

For current unit values and GIC rates call CDSPI toll-free at: 1-800-561-9401, ext. 525. (Metro Toronto call: (416) 296-9401.)

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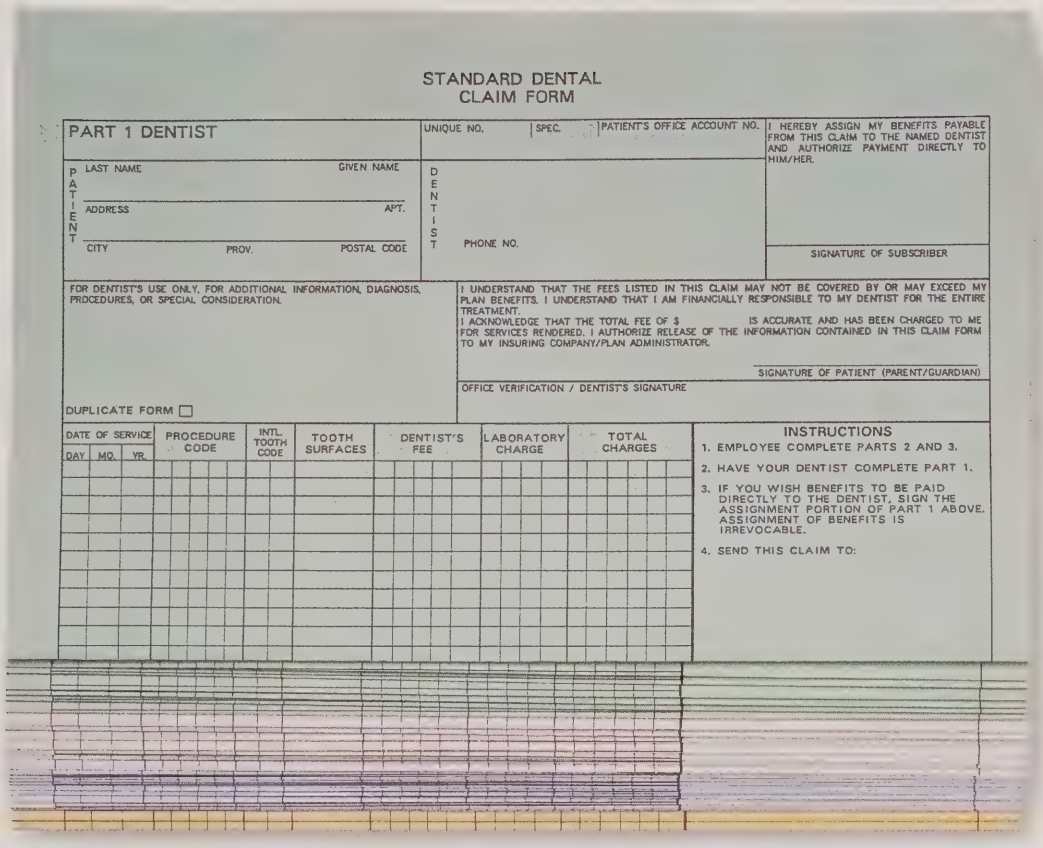
Simple VS Complex



STANDARD DENTAL CLAIM FORM

PART 1 DENTIST

UNIQUE NO. | SPEC. | PATIENT'S OFFICE ACCOUNT NO.

I HEREBY ASSIGN MY BENEFITS PAYABLE FROM THIS CLAIM TO THE NAMED DENTIST AND AUTHORIZE PAYMENT DIRECTLY TO HIM/HER.

PATIENT: LAST NAME | GIVEN NAME | ADDRESS | APT. | CITY | PROV. | POSTAL CODE

DENTIST: PHONE NO.

SIGNATURE OF SUBSCRIBER

FOR DENTIST'S USE ONLY, FOR ADDITIONAL INFORMATION, DIAGNOSIS, PROCEDURES, OR SPECIAL CONSIDERATION.

I UNDERSTAND THAT THE FEES LISTED IN THIS CLAIM MAY NOT BE COVERED BY OR MAY EXCEED MY PLAN BENEFITS. I UNDERSTAND THAT I AM FINANCIALLY RESPONSIBLE TO MY DENTIST FOR THE ENTIRE TREATMENT.
I ACKNOWLEDGE THAT THE TOTAL FEE OF $ IS ACCURATE AND HAS BEEN CHARGED TO ME FOR SERVICES RENDERED. I AUTHORIZE RELEASE OF THE INFORMATION CONTAINED IN THIS CLAIM FORM TO MY INSURING COMPANY/PLAN ADMINISTRATOR.

SIGNATURE OF PATIENT (PARENT/GUARDIAN)

OFFICE VERIFICATION / DENTIST'S SIGNATURE

DUPLICATE FORM ☐

DATE OF SERVICE			PROCEDURE CODE	INTL. TOOTH CODE	TOOTH SURFACES	DENTIST'S FEE	LABORATORY CHARGE	TOTAL CHARGES
DAY	MO.	YR.						

INSTRUCTIONS
1. EMPLOYEE COMPLETE PARTS 2 AND 3.
2. HAVE YOUR DENTIST COMPLETE PART 1.
3. IF YOU WISH BENEFITS TO BE PAID DIRECTLY TO THE DENTIST, SIGN THE ASSIGNMENT PORTION OF PART 1 ABOVE. ASSIGNMENT OF BENEFITS IS IRREVOCABLE.
4. SEND THIS CLAIM TO:

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CANADIAN DENTAL ASSOCIATION

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Consider the track record of the CDA RSP's long-standing funds over the last 10 years. The CDA Common Stock Fund, Balanced Fund, Bond & Mortgage Fund and Money Market Fund have all outperformed the industry average.*

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You also gain the stability of a plan that's enjoyed success for over 38 years. A choice of 10 Canadian and international funds managed by some of the country's leading fund managers — including Altamira Management Ltd. And the lowest fees you're likely to find anywhere.

So call CDSPI to find out more. Then make the CDA RSP the driving force behind your retirement planning.

* Comparison of CDA RSP fund performance with averages of similar funds offered in the marketplace before sales charges, for the period ending October 31, 1995 as published in the Globe and Mail, November 16, 1995. Comparisons are based on past performance and are not necessarily indicative of future performance.

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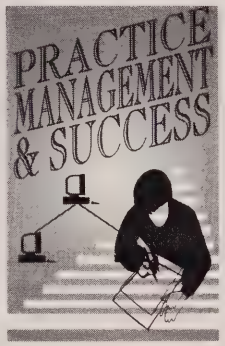
[illegible]

The Modular Dental Management System, EXCEL, is endorsed by CDSPI.
For information contact Zodall Systems Group Inc. Telephone 1-800-663-1256.



Going Up Or Down?

Imtiaz Manji, B.Sc.

Next time you happen to be in a tall building, try this experiment. From the lobby, get into the elevator and hit the button for the top floor. Once the elevator is moving, close your eyes and concentrate on how it feels when the elevator is going up. At the top floor, hit the button to go back to the lobby. Again, close your eyes once the elevator is moving, and concentrate on how it feels when the elevator is going down.

Unless you focus very intently, it is virtually impossible to tell the difference between going up and going down, once the elevator is moving. Of course, you only need to glance at the indicator above the door to know where you've been, where you are, and where you're going.

Your practice is an elevator that is constantly moving up and down in the dental market. Unlike an actual elevator, where one indicator tells you everything, you need many kinds of information to get a good idea of what direction your practice is travelling in. This may explain why most dentists are not informed about the true direction that their practices are taking. It's as if they are riding an elevator with their eyes closed.

Here are the indicators in the dental market that I am concerned about:

- In real dollars, patient incomes are declining.
- The number of patients covered by comprehensive third-party insurance is declining.
- The number of employees who receive no dental benefits is increasing.
- Traditional insurance plans are becoming more limited.
- Employers are reducing employee benefits through programs like flex plans or managed care.

The result is a patient base that is in flux. We must learn to create more value for our patients, since more and more of them will be pressured by external economic forces to place less value on dental services, to come in less frequently, and to accept less treatment.

Because patient incomes are declining, patients have less discretionary income to spend on dental services. It is much more difficult to commit a patient who has no insurance to return every six months than one who has insurance that covers two visits per year. To an uninsured patient, semi-annual visits often seem excessive and a luxury that cannot be afforded.

Similarly, insurance companies are now tuning in to the fact that patients are lowering their expectations about what kind of care they are willing to pay for. As a result, in some areas of this country, more than 50 per cent of new patients who have insurance are only covered for one recare visit per year. This is an extremely important trend, when you consider that your new patients of today will define your patient base for tomorrow. To put this in perspective, ask yourself how your practice would be affected if 50 per cent of the patient base only came in for recare once per year.

Recently, ExperDent performed an informal survey of dental practices in Eastern and Western Canada to answer such questions. Two groups were surveyed in the East and one in the West. Here are some of the results:

With an average patient base of 1,836 patients, a well-managed practice should be able to keep two full-time hygienists busy, assuming that most patients are on six-month recare cycles (**Fig. 1**).

Similarly, with 12.1 referred new patients and 8.5 new patients from other sources, the average practice received 20.6 new patients per month (**Fig. 2**). Sadly, our survey also showed that practice growth in most practices was negligible. In other words, new patients are simply replacing existing patients who have left these practices.

The average recare participation rate of 89 per cent indicates that nearly nine in 10 patients come in regularly for recare visits (**Fig. 3**).

Using these numbers, let's examine how the hygiene base of the average practice would be affected if 50 per cent of the patients had only one recare visit per year

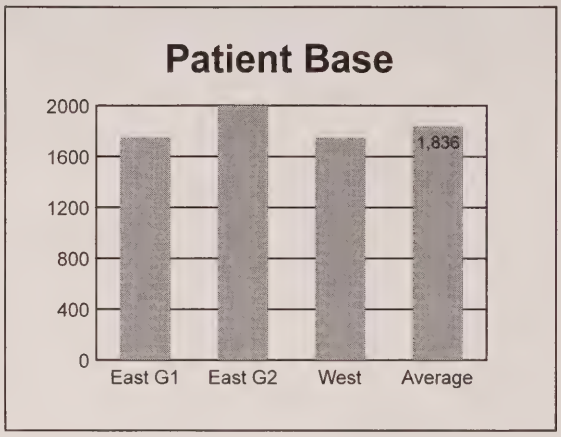


Fig. 1

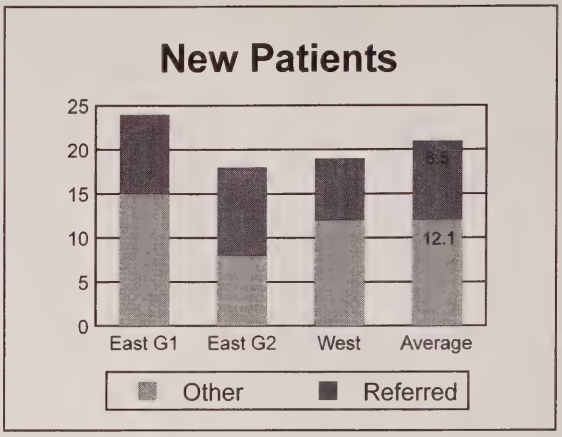


Fig. 2

(**Table I**). Remember, this scenario could be the reality within a few years, depending on how rapidly insurance companies convert their policies to one year recare coverage.

The 100 per cent column in **Table I** shows the average dynamics for a practice with no downtime, where the entire patient base returns every six months and 89 per cent of the patient base participates in recare. (I have assumed eight appointments per hygiene day.)

The 50 per cent column in **Table I** shows the effect on the practice if half of the patient base returns only once per year. As can be seen, 25 per cent of the hygiene visits for the practice are lost. To get a better idea of the impact this would have on an average practice with two full-time hygienists, imagine losing one hygienist for two weeks every month, along with the revenue for those weeks. This amounts to nearly $83,000 per year, based on the average of our survey results. Furthermore, try to imagine the impact on your clinical diagnoses, productivity and profit. For a practice dependent on six-month recare, the shift to a yearly cycle marks the beginning of the end.

Dentistry has two massive blind spots that are not only pulling practices down, but are threatening to cut the cables that support the entire well-being of dentists across Canada. These blind spots are the six-month recare visit and our reliance on insurance to underpin patient flow.

Dentists persistently cling to the six-month recare cycle — an idea born in the 1920s when the concept of oral health itself was still being developed. But now, in the 1990s, patients have access to better preventive and home-care tools like fluoridation, sealants, electric toothbrushes and advanced toothpastes. Yet, regardless of whether a patient is diligent and effective with their home care or not, all of them are typically programmed into our recare systems to return every six months.

The six-month recare is a religion to many practices — taken purely on faith. Dentists have been indoctrinated from day one to believe that the six-month recare is necessary for both patient health and practice success. We've set up our practices to revolve around patients returning twice per year for preventive treatment. In the past, when patients, employers and insurers were willing to pay for it, this was a good model for practice success. These days, however, many practices are not achieving the success they did in the past for one good reason: the six-month recare appointment is dying. Most dentists, standing in their practice with their eyes closed, haven't seen this change coming.

Insurance as we have known it in the past 20 years is evaporating before our eyes. Dentists have become very efficient at motivating patients to use their insurance benefits. But increased use means increased risk for the insurance companies, since it causes the margin between premium revenues and claim cost to shrink. Out of necessity to protect their profits, insurance companies have been forced to increase premiums and decrease utilization. This has been accomplished through various means, such as limiting coverage or raising deductibles.

We have reached the point where patients are starting to doubt the value of dental insurance, and employers are balking at the cost. The entire third-party system is a sitting duck waiting to be shot out of the water. The hunter, of course, is managed care, which exploits the fact that employers are demanding lower cost alternatives, and patients don't know the difference between the traditional fee-for-service model and what they'll get from a preferred provider organization, or some other set-up. Meanwhile, many dentists toil on under practice models that are dependent on a significant volume of patients with traditional insurance.

In a November 1995 survey, 22 per cent of dentists across the United States reported that they had signed a managed care contract in the previous 12 months. This fact alone is terrifying, since it is a testament to the growing penetration of managed care into our dental delivery system.

When managed care tried to get a handhold in Ontario in the 1980s, it was promoted by insurers, rather than employers, as an alternative to traditional plans. In

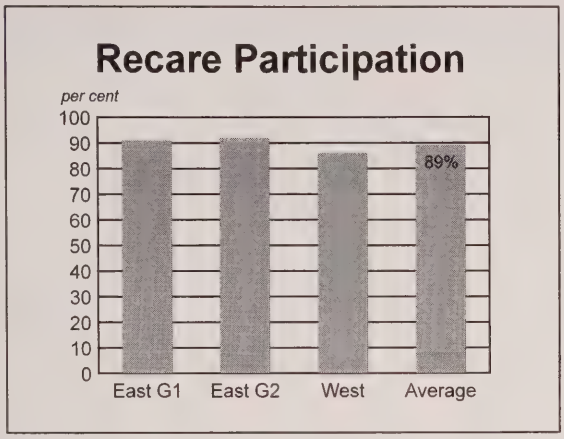


Fig. 3

Table I

	100 per cent	50 per cent
Total Patient Base	1,836	1,836
Recare Patient Base	1,634	1,634
One-Year Recares	0	817
Six-Month Recares	3,268	1,634
Total Recares	3,268	2,441
Hygiene Days	409	305
Hygiene Base Lost		**25 per cent**

the end, there was no buy-in from Ontario companies or their employees, and dentists across the province remained united in their opposition to the concept. Today, however, it is employers and patients who are promoting managed care. "Better something than nothing!" is their slogan.

As well, managed care is getting smarter by disguising itself in the trappings of fee-for-service dentistry. All it will take for managed care to take off in this country (as it has in the U.S.) is for a few dentists to feel the pinch in the bottom line, be swayed by the promotional hype, read over a well-written contract, and decide for themselves — "Better something than nothing!"

The only way to protect dentistry is for dentists to develop practices that are not dependent on either managed care or traditional insurance. As dentists, you must take the initiative by creating value for the services you provide and communicate directly with patients to maintain your standards and improve theirs.

In the next few months, I will be looking at five key areas of your practice: expense management, patient base management, hygiene productivity, clinical productivity and marketing. In addition, I will present results from ExperDent's practice survey and outline the actions you must take to reconstruct your practice, rise against downward trends, and protect yourself from threats to your future as a successful dentist. ■

Imtiaz Manji is a principal of ExperDent Consultants Inc., 80-10551 Shellbridge Way, Richmond, B.C. V6X 2W9 Tel.: (604) 278-5059, or fax: (604) 278-1406.

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St. John Ambulance

Efficacy Of Ketorolac In the Management Of Pain Associated With Root Canal Treatment

Deborah Battrum, DDS, M.Sc.D
James Gutmann, DDS

ABSTRACT

Patients requiring root canal treatment were randomly assigned to one of three groups. The first group received Ketorolac oral 10 mg at six hour intervals for 24 hours, the second group received Ketorolac (Toradol) injectable 10 mg at the height/depth of the buccal vestibule of the tooth to be treated, and the third group received no assigned medication.

Significantly better pain relief was achieved when Ketorolac injectable or oral was used then when no drug was administered. Some of the patients in the Ketorolac injectable group felt that an additional dose of medication would have been helpful at the six- to eight-hour postoperative period. However, there was no significant difference in pain relief between the two groups treated with different drug regimens.

SOMMAIRE

Les patients ayant besoin d'un traitement de canal ont été répartis en trois groupes : le premier a reçu par voie orale 10 mg de Ketorolac aux six heures pendant 24 heures; le deuxième a reçu des injections de 10 mg de Ketorolac (Toradol) à la hauteur/profondeur du vestibule buccal de la dent à traiter; et le troisième n'a reçu aucune médication.

On a obtenu un soulagement beaucoup plus important de la douleur grâce à Ketorolac, par voie buccale ou par injection, que lorsqu'on n'a pas utilisé de médicament. Certains patients du deuxième groupe ont eu l'impression qu'une dose additionnelle de Ketorolac aurait aidé entre six et huit heures après l'opération. On n'a cependant pas noté d'écart important quant au degré de soulagement de la douleur entre les deux groupes qui ont reçu le médicament sous des modes différents.

Introduction

The perception of pain is a complex process. It is initiated peripherally through the mechanical or thermal stimulation of free nerve endings, or by the release of chemical substances following tissue damage. During non-surgical root canal treatment, multiple opportunities exist for mechanical, bacterial and chemical insult, resulting in the release of inflammatory mediators. Pain-producing mediators include bradykinin, histamine, leukotrienes and various oxidative products of arachidonic acid.

Among the oxidative by-products of arachidonic acid, which occurs in all mammalian tissue except for erythrocytes, are the prostaglandins.[1] These fatty acids are produced after stimulation, and are not stored for future release in response to insult. Once released, prostaglandins are believed to sensitize pain receptors to stimulation by inflammatory mediators, resulting in episodes of pain.[2] In modern dental practice, the prevention or control of prostaglandin release is primarily achieved through the use of non-steroidal anti-inflammatory drugs (NSAIDs).

Although their specific mechanism of action is not totally understood, NSAIDs are believed to inhibit the release of inflammatory mediators peripherally, at the site of injury.[1] A newer NSAID, Ketorolac trimethomine (Toradol), is a peripherally-acting analgesic that can be administered orally or intramuscularly for the treatment of non-chronic pain. Like other NSAIDs, it is a potent inhibitor of cyclo-oxygenase, the enzyme responsible for the conversion of arachidonic acid to prostaglandin, thereby inhibiting prostaglandin synthesis. Ketorolac has been used with considerable success to provide pain relief, with fewer side effects than hydrcodone/acetaminophen, in patients undergoing surgical extraction of impacted third molars.[3] Numerous articles have been published describing the efficacy of NSAIDs in oral and ambulatory surgery patients[4,5] during the first postoperative hours, when postoperative dental pain usually reaches its maximum intensity, particularly in surgical cases.[6,7]

To maximize the analgesic benefits of NSAIDs, prescribing habits depart from the traditional practice of "take as needed" (prn), which is commonly used with narcotics. The prn regimen does not use the benefits of NSAIDs to their fullest extent. Instead, NSAIDs should be prescribed on a fixed-dose regimen.[8] Sisk and Bonnington[7] outline their reasoning for fixed-dose prescribing as follows: bradykinin, histamine and oxidation products of arachidonic acid are produced in response to tissue injury, and these by-products are able to react with oxygen in the presence of cyclo-oxygenase to produce prostaglandins, prostacyclins and thromoboxanes. These substances are known to play a role in initiating pain and swelling, so it is sensible to take steps to avoid the production of these chemicals. Not only do prostaglandins sensitize nociceptors, contributing to pain at the site of injury, they also enhance the edematous and pain response initiated by bradykinin and histamine.[9]

Jackson et al[8] note the importance of the plasma extravasation process, which occurs after tissue injury, due to the pain caused by the resultant edema and the transfer of fluid from the vascular to the extracellular compartment. The extravasated fluid contains inflammatory mediators, such as bradykinin, which enhance the synthesis of prostaglandins. Since prostaglandins also potentiate bradykinin action, there is a positive feedback relationship.[8] The NSAID mechanism inhibits prostaglandin synthesis in traumatized tissue, thereby minimizing the pain and edema associated with inflammation.[19] It follows that there is a latency period between the administration and the action of the NSAID, if administration occurs after the injury. If a NSAID is given orally, time must be allotted for dissolution, absorption and distribution. Postoperative administration alone would allow for some prostaglandin synthesis to take place subsequent to tissue injury, before the NSAID has time to act. The injectable NSAID, however, precludes the absorption problem, since the drug is immediately located at the site of injury.

no pain — worst pain possible

PAIN INTENSITY SCALE

Describe the pain which you are feeling:
- NO PAIN
- MILD PAIN
- DISCOMFORTING
- DISTRESSING
- HORRIBLE
- EXCRUCIATING

VERBAL (PAIN) RELIEF SCALE

Describe the pain relief which you have recieved:
- NONE
- SLIGHT
- MODERATE
- GOOD

Fig. 1: *Visual Analog Scale.*

The presence of inflammatory mediators during endodontic treatment is well documented. If patients present in pain, inflammatory mediators are already present. During treatment, small amounts of canal contents and irrigants may enter the periradicular area, inducing or enhancing the inflammatory response. After treatment, the removal of extruded materials and repair of damaged tissues are not immediate, so once again the inflammatory response may play a role in pain production. The timely administration of NSAIDs may reduce or eliminate inter-appointment pain if inflammatory mediator production is kept to a minimum.

The purpose of this study was to determine if there is a difference in perceived inter-appointment pain levels in patients undergoing non-surgical root canal treatment when they receive single dose Ketorolac injectable at the time of treatment, Ketorolac oral at six-hour periods for 24 hours, or only root canal treatment.

Methodology

This study was a prospective "open-label" comparison of three groups of patients. There were 10 patients in each group. Depending on their group, patients were administered:

Group I: Ketorolac 10 mg oral four times (at operative time and at six-hour intervals for 24 hours);

Group II: Ketorolac 10 mg injection at the height of the buccal vestibule after the administration of local anesthesia; and

Group III: root canal treatment only. These patients were given Ketorolac 10 mg tablets as a "rescue" medication if they felt that they needed pain relief.

The importance of including a placebo group as a positive control was recognized. However, the Institutional Review Board of Baylor College of Dentistry (IRB) refused to allow the inclusion of this group on the grounds that it would be unethical, even though patients were given the opportunity to take "rescue" medications as needed. All patients signed an informed consent form prior to treatment, and were given a telephone number to call during or after business hours if additional pain relief was necessary.

Only ASA 1 (American Society of Anesthesiology) healthy patients were accepted for this study, with the following exclusions:[10] those with hypersensitivity to Ketorolac, asthmatics, and those with nasal polyps or other allergic manifestations to aspirin or other NSAIDs.

Table I

Degrees of Pain Prior to Treatment

Patient		Age	Sex	Race	Procedure Time (min.)	Pre-operative Pain	Baseline	
							VAS	PIS
Group I	1	54	F	Black	90	yes	47	4
	2	27	F	Caucasian	65	no	0	0
	3	55	M	Caucasian	100	no	0	0
	4	22	M	Caucasian	90	yes	25	2
	5	47	F	Black	75	yes	67	3
	6	30	F	Caucasian	90	yes	0	0
	7	46	F	Hispanic	90	yes	74	3
	8	46	F	Hispanic	65	yes	35	2
	9	42	F	Caucasian	70	yes	90	4
	10	48	M	Caucasian	95	no	0	0
Group II	1	22	F	Caucasian	85	yes	88	5
	2	48	F	Caucasian	75	no	0	3
	3	49	M	Caucasian	95	yes	20	1
	4	30	F	Caucasian	65	yes	45	1
	5	26	F	Hispanic	110	no	33	0
	6	42	F	Caucasian	100	no	0	0
	7	42	F	Caucasian	75	no	0	0
	8	33	M	Hispanic	100	no	0	1
	9	44	F	Black	60	yes	8	0
	10	40	M	Black	85	yes	8	4
Group III	1	30	F	Caucasian	75	yes	7	0
	2	22	F	Caucasian	85	yes	48	1
	3	23	F	Caucasian	100	no	0	0
	4	31	F	Caucasian	110	no	0	0
	5	55	F	Caucasian	120	no	7	0
	6	48	F	Caucasian	80	yes	45	2
	7	41	M	Black	65	yes	9	0
	8	55	M	Hispanic	85	no	0	0
	9	58	F	Caucasian	75	no	0	0
	10	24	F	Caucasian	90	yes	9	0

Note: *One way ANOVA for baseline — VAS = 0 hrs.; F = 1.32; p = 0.288.*
One way ANOVA for baseline — PIS = 0 hrs.; F = 0.7; p = 0.701.
Groups considered equal.

Patients with a history of gastrointestinal ulcers, bleeding or perforation, renal disease, or hemostatic problems were also excluded. All patients were between 18 and 65 years of age, were not pregnant or nursing, were willing and able to communicate in English, and agreed to take the medications at the prescribed times, as well as to complete the questionnaires supplied to them. All patients required treatment for a recognized endodontic diagnosis such as irreversible pulpitis, pulpal necrosis, or acute periradicular periodontitis.[11]

Only patients who would normally have been given a prescription or advised to take an over-the-counter analgesic medication were invited to participate in the study. Those who met the criteria for participation were randomly assigned to one of the three study groups. Prior to taking any medication, the patient was asked to complete the Visual Analog Scale (VAS) and the Pain Intensity Scale (PIS)[12,13] (**Fig. 1**).

Patients were anesthetized with Lidocaine two per cent, 1:100,000 epinephrine, using either one or two cartridges. Once anesthesia was obtained, patients in the second group were administered Ketorolac injectable, 10 mg, at the height (depth) of the buccal vestibule over the apex of the tooth being treated. Root canal treatment was performed in one or two appointments, depending on time and clinical constraints. All teeth were isolated with a rubber dam and accessed. Canals were cleaned and shaped using NaOCl 5.25 per cent and REDTA as irrigants. At six hours postoperatively, patients were asked to fill out an additional VAS, PIS, and PRS (Pain Relief Scale) (**Fig. 1**). This request was repeated at 24 hours postoperatively.

The VAS, PIS and PRS tests were chosen to measure pain at baseline and postoperatively since, due to their internal consistency, test-retest reliability and inter-rater reliability, their validity is well established.[14,15] The single dimension subjective measurement scale, or Visual Analog Scale, is represented by a line, 10 cm in length. One end represents "no pain," while the other end represents the "worst pain possible"[16,17] (**Fig. 1**). The patient scores the line to represent the amount of pain felt. This scale is widely used and, independent of language, is easily understood and reproducible.[17]

The PIS and VRS have been shown to be more sensitive to sex and ethnic differences than the VAS. The scale used in this study was from the Present Pain Intensity Index of the McGill Pain Questionnaire.[14] Patients were asked whether they would rate their pain as: no pain, mild pain, discomforting, distressing, horrible, or excruciating.

Only one clinician treated patients and collected data, in an attempt to standardize both treatment procedures and data collection. Since patient cooperation and compliance are always a challenge when patients are prescribed medication or asked to complete a questionnaire, attempts were made to schedule all appointments to interfere minimally with their sleep and day-to-day routines.

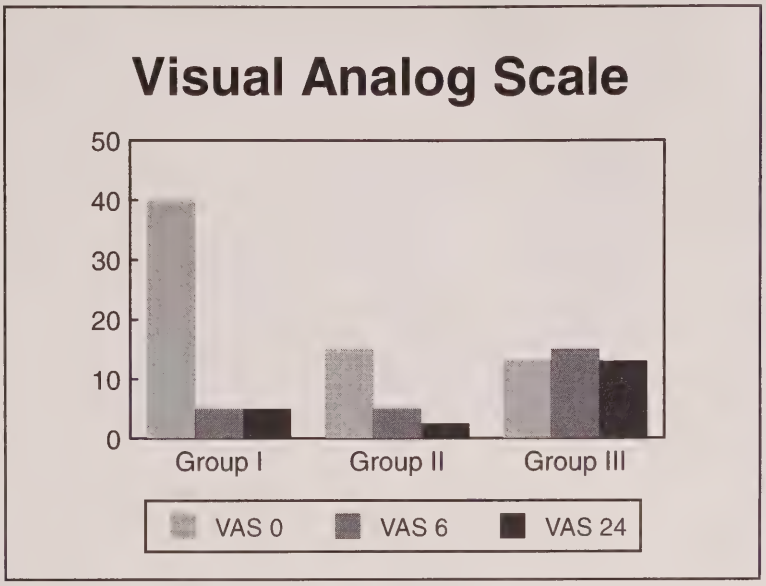

Fig. 2: Results of VAS for three groups: (Group I) Ketorolac 10 mg oral q-6-h, (Group II) Ketorolac 10 mg injectable, (Group III) no fixed drug regimen.

Statistical Analysis

Data were subjected to the ANOVA (analysis of variance) to detect differences between groups, and then to t-tests, paired tests and finally t-intervals of 95 per cent, ($p = 0.05$).

Results

Thirty patients participated in the study. As shown in **Fig. 2**, there was a wide range of pain responses at time zero. This is appropriate, because patients were randomly assigned to drug groups, and similar pain responses could be expected in clinical practice. However, ANOVA showed no significant differences in any of the three groups for the VAS or PIS, at baseline ($p = 0.05$). Therefore, for statistical purposes, the three groups all demonstrated similar degrees of pain prior to treatment (**Table I**).

Group I patients took Ketorolac 10 mg po, every six hours starting at time of treatment. As noted in **Fig. 2**, there was a general decrease in pain over the 24-hour period, as measured by the VAS. Application of the PIS showed similar results over the 24-hour period, as shown in **Fig. 3**. Application of t-tests and paired t-test showed a significant decrease in pain levels, as demonstrated by the VAS, measured at six and at 24 hours ($p < 0.05$).

Group II patients received Ketorolac parenterally, and demonstrated a decrease in pain levels at six and 24 hours. However, this was not significant ($p = 0.17$ and $p = 0.14$ respectively).

For **Group III** patients, there was no significant decrease in pain at six and 24 hours. However, there was a significant difference in pain between six and 24 hours when paired t-tests were applied ($p = 0.03$). The difference in the pain relief of both Ketorolac groups, when compared to the non-medicated group, is significant (**Fig. 2**). The VAS shows a large decrease in pain intensity six hours after treatment for both medicated groups, while the non-medicated group shows approximately the same level of pain as at the start time. There was also a trend for Ketorolac injectable (**Group II**) patients to show more rapid onset and better pain relief than the non-medicated group. There was a significant difference in pain relief between the oral and injectable group as well, with the oral regimen of four tablets over 24 hours providing superior pain relief compared to a single injection of Ketorolac just prior to treatment ($p < 0.05$).

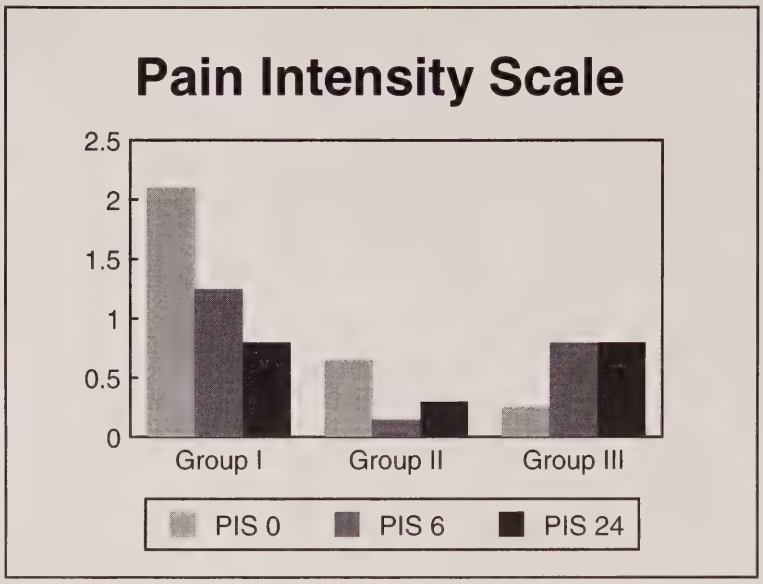

Fig. 3: Results of pain intensity scale.

In order to compare the results of the VAS, the PIS scale results were analyzed. Similar results were found (**Fig. 3**). Both the oral and injectable groups showed a general decrease in patient-assessed degrees of pain, while the non-medicated group, as a whole, reported approximately the same amount of pain at the start time as it did over the entire 24-hour period. Similarly, when the verbal rating scale (VRS) was applied at the six- and 24-hour periods, patients in both the injectable and oral Ketorolac groups demonstrated pain relief scores significantly higher than those of patients in the non-medicated group ($p = 0.05$) (**Fig. 4**).

Discussion

Although many patients believe that root canal therapy is a painful experience, this perception is not always well founded in fact.[18] It does, however, amplify the multifactorial nature of pain. Because pain has both a physiologic and psychological component,[1] its perception is strongly influenced by the conditions under which the stimulus is received.[19] In addition, a surgical or non-surgical procedure, on its own, may cause placebo effects that influence patient outcomes, i.e. if the patient and/or clinician expects the intervention to be effective, it may prove to be so.[19] It is therefore possible to incorrectly attribute a high rate of acceptable outcomes to a particular drug or treatment modality.[20]

Placebo groups are commonly used in drug efficacy studies. For ethical reasons, however, when a placebo group is included, all patients are informed about the possibility of receiving a "sham" treatment. To the extent that the patient or clinician believes a treatment may be ineffective, the power of non-specific effects will be reduced or underestimated, and the power of specific effects may be overestimated.[20] The control treatment in a trial should approximate the active treatment as closely as possible. It is important to create similar expectations in the placebo group as in the group(s) having a drug treatment, as well as during the active treatment itself. In this study, the use of a placebo group, although rejected by the IRB, would have provided useful information on the effects of a positive control. Essentially, in this study, the third group, who were not assigned or administered a fixed dose of Ketorolac, can be considered as the negative control group. Their treatment plan reflects common dental practise, i.e., most patients are told: "you probably won't need any medication, but if you do take this."

Although it is desirable to use a double-blind design in drug studies to minimize the placebo effect, institutional restraints precluded this approach in this study. However, the inclusion of **Group III** probably resulted, to some extent, in a more realistic scenario. For the majority of practitioners, medications are assigned on a take-as-needed basis. In this study, **Group III** was intended to serve as an experimental positive control, because it proved impossible to use a true negative, or placebo group, control.

The efficacy of NSAIDs in reducing the production of prostaglandins due to tissue injury is well documented.[3-7] Regardless of whether treatment is dental, gastric or gynecological, the ultimate result is tissue injury, subsequent prostaglandin production and resulting pain. Endodontic patients often present in pain prior to treatment, however, which places them in a different pain model than the elective patient who is not in pain. When the patient is already in pain, the presence of prostaglandins is a *fait accompli*. As a result, this patient's physiological and psychological perceptions of pain are vastly different. Treatment may improve the pain situation on its own, given time. However, if the patient presents in pain, the administration of a NSAID could lead to a significant improvement in the patient's perception of postoperative pain, by reducing the production of circulating prostaglandins. The results of this experiment support this concept, since the patients who presented in pain and received Ketorolac reported significantly less severe pain on an interappointment basis than those who received root canal treatment only, and no fixed-dose NSAID.

The baseline measurement of pain via the VAS and PIS indicates that there was no significant difference in pain scores between groups at this stage of treatment. **Groups I** and **II** both showed significant reductions in pain over the 24-hour postoperative period, however. There were no reports of adverse reactions in the Ketorolac parenteral group, and only one patient reported gastric upset via the oral route. Two of the patients in

the Ketorolac injectable group commented that they felt the need for additional minor pain relief at approximately the eight- to 10-hour postoperative period. This would be a consideration for recommending a follow-up dose at a six- to eight-hour postoperative period. Not only would it likely relieve the reports of pain at this stage of recovery, it would also save the cost of a multi-dose prescription. Since clinicians generally do not write a prescription for only one or two tablets, providing the patient with a couple of tablets directly would relieve patient episodes of pain, reduce costs to the patient, and likely improve the patient's overall impression of root canal procedures.

There was no significant difference in the paired t-test scores of the injectable group between the six- and 24-hour postoperative period. However, there was a significant decrease in pain between the six- and 24-hour period for the oral group. None of the patients in any group availed themselves of the opportunity to call their clinician for additional medication or treatment, even though they had been encouraged to do so if they felt pain.

Among the patients who received root canal treatment only, 50 per cent[20] reported taking the medication (Ketorolac 10 mg oral) that they had been instructed to use on an "as needed" basis for pain relief. This group of patients may have felt that root canal intervention, on its own, was not sufficient to relieve their pain. As the manufacturer states, the duration of action for both oral and injectable Ketorolac is approximately six hours. The results of this study support this.

In the past, many patients were prescribed narcotic analgesics as a means of pain control. However, the complications and adverse effects associated with the administration of narcotics, such as nausea, constipation, dysphoria, drowsiness and vomiting, precluded their use in many patients. Another problem was the inability of narcotics to provide sufficient peripheral management over the release of mediators. None of the patients in the Ketorolac groups reported any of these adverse effects.

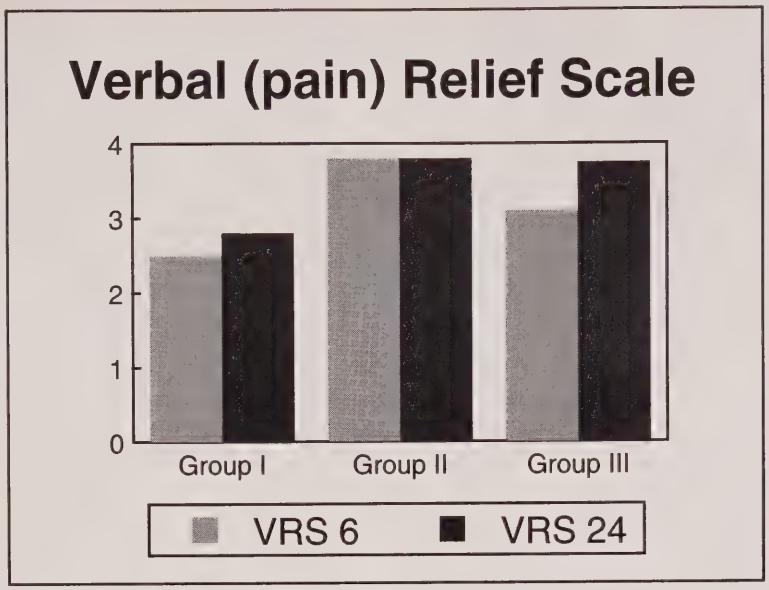

Fig. 4: Results for verbal (pain) relief scale.

During root canal cleaning and shaping, it is difficult to prevent the extrusion of pulpal tissue remnants and dentin filings — at least in minute amounts — into the periradicular tissues.[11] It seems sensible to attempt to minimize the additional inflammation caused by these operative problems, in addition to controlling the initial inflammation concomitant with a degenerative pulpal state. From this study, it would appear that the administration of Ketorolac aids in minimizing the painful sequelae of an inflammatory response.

It may be worthwhile to consider the study of Forbes et al,[5] and compare their findings with the present study. Forbes and his colleagues used Ketorolac 10 mg, aspirin 650 mg, acetaminophen 600 mg/codeine 60 mg and a placebo to assess postoperative pain in an oral surgery model. Their procedures were limited to a 20- to 25-minute period. In our study, clinical procedures lasted a minimum of 70 minutes.

All subjects in the Forbes et al study rated the "placebo-only" approach as inferior to all other medications (placebos were not used in our study). Ketorolac was found to be significantly superior to aspirin and the acetaminophen/codeine combination for total effects and analgesia. Also, Ketorolac did not cause the unwanted central effects that occur in many patients following the administration of narcotics.

Similar to our study, Forbes et al found that Ketorolac was effective for six hours. They also found that adverse effects were four times greater with narcotic medications, versus Ketorolac or aspirin. Their oral surgery model was also similar to our study with respect to the ratings of baseline pain (some moderate, some severe). In our model, however, many of the patients did not present in pain.

Forbes et al[5] point out that many analgesic efficacy studies only evaluate a single dose of medication. In their model, they follow the patients' pain levels and medication dosage for five days. Significantly, only 57 per cent of their Ketorolac patients had remedicated by hour six. Our study showed the same findings with the Ketorolac 10 mg injectable group, in that only two of the patients felt additional medication would have been beneficial at six hours. None of the patients in our study reported pain after 48 hours.

Conclusion

A clinical study was performed in which patients presenting for root canal treatment procedures, with various degrees of pain, were randomly assigned to one of three

groups: Ketorolac 10 mg oral, four doses, one every six hours (**Group I**); Ketorolac injectable 10 mg at the apex of the tooth in the buccal vestibule (**Group II**); or no assigned medication (**Group III**). All patients were given the opportunity to take escape medication if needed. None felt the need to do so, except in the non-medicated group.

The results of this study showed better pain relief when Ketorolac oral or injectable were administered than when no medication was prescribed. Both medicated groups experienced significantly better pain relief than the non-medicated group. However, some of the Ketorolac injectable patients felt that an additional dose of medication would have been helpful at approximately six to eight hours postoperatively. There was significantly better pain relief at the six- and 24-hour postoperative periods in the oral group than in the single-dose parenteral group. A follow-up dose of 10 mg Ketorolac oral, to be taken at approximately six hours postoperatively, is recommended when the regime of 10 mg Ketorolac injectable is administered preoperatively. ■

Acknowledgments: IRB refers to the Institutional Review Board of Baylor College of Dentistry. All studies involving human subjects must receive approval from this board, prior to commencing any study. The present study represents a partial requirement for a Certificate in Advanced Specialty Education in Endodontics. Toradol is a registered trademark of Hoffman La Roche, Palo Alto, California.

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DID YOU KNOW?

Build Me a Son, O Lord

Build me a son, O Lord, who will be strong enough to know when he is weak, and brave enough to face himself when is he is afraid; one who will be proud and unbending in honest defeat, and humble and gentle in victory.

Build me a son whose wishes will not take the place of deeds; a son who will know Thee...and that to know himself is the foundation stone of knowledge.

Build me a son whose heart will be clear, whose goal will be high, a son who will master himself before he seeks to master other men; one who will reach into the future, yet never forget the past. After all these things are his, add, I pray, enough of a sense of humor, so that he may always be serious, yet never take himself too seriously. Give him humility, so that he may always remember the simplicity of greatness, the open mind of true wisdom and the meekness of true strength.

Then, I, his father, will dare to whisper, "I have not lived in vain."

(General Douglas A. MacArthur)

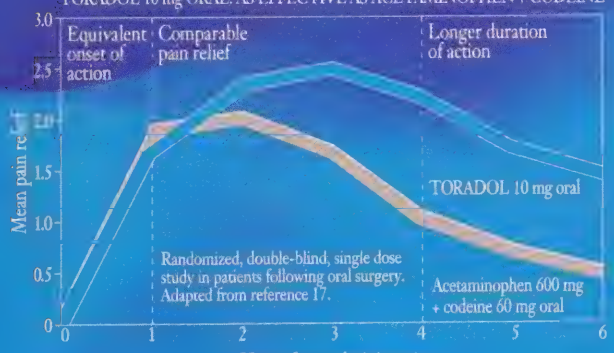
TORADOL

Providing highly effective relief in acute dental pain.

Current strategies in acute pain management suggest a non-narcotic analgesic should be used first, before a narcotic is considered.[10]

Toradol (ketorolac tromethamine) oral has been proven effective in acute post-dental surgical pain such as third molar extraction pain and mandibular pain.[17,18,62] Toradol may also provide effective relief for your patients suffering from toothache pain and endodontic/periodontic pain.

TORADOL 10 mg ORAL: AS EFFECTIVE AS ACETAMINOPHEN + CODEINE



Measure of pain relief: 0=none, 1=poor, 2=fair, 3=good, 4=very good

Unlike narcotics which work at the CNS, Toradol works peripherally, at the site of the pain,[2,3,58] and therefore has a lower incidence of nausea, dizziness, drowsiness and constipation.[17,18,21,22] The lower CNS side effects may be of particular benefit to patients who need to drive, operate machinery and remain alert or active.

By class, Toradol belongs to the non-steroidal anti-inflammatory drug (NSAID) family. However, unlike conventional NSAIDs, it is a potent analgesic agent with minimal anti-inflammatory and antipyretic activity. As with all NSAIDs, the most common side effects with Toradol involve the G.I. tract.

With proven efficacy and patient tolerability, Toradol oral is a logical first choice in the short-term management of acute dental pain.

TORADOL

10 mg tablets & 30 mg/mL IM injections KETOROLAC TROMETHAMINE

Effectively treating acute pain

Treatment not to exceed 7 days for musculoskeletal pain. Post-surgical patients not to exceed 5 days.

TORADOL®

10 mg tablets & 30 mg/mL IM injections KETOROLAC TROMETHAMINE

Effectively treating acute pain

TORADOL® (ketorolac tromethamine) 10 mg tablets
TORADOL® IM (ketorolac tromethamine injection) 10 mg/mL or 30 mg/mL intramuscular injection
THERAPEUTIC CLASSIFICATION NSAID Analgesic Agent

ACTION

Toradol (ketorolac tromethamine) is a non-steroidal anti-inflammatory drug (NSAID) that exhibits analgesic activity mediated by peripheral effects. Ketorolac inhibits the synthesis of prostaglandins through inhibition of the cyclo-oxygenase enzyme system. At analgesic doses, it has minimal anti-inflammatory and antipyretic activity. Pain relief is comparable following the administration of ketorolac by intramuscular or oral routes. The peak analgesic effect occurs at 2-3 hours post-dosing with no evidence of a statistically significant difference over the recommended dosage range. The greatest difference between large and small doses of Toradol administered by either route is in the duration of analgesia. Ketorolac tromethamine is rapidly and completely absorbed when administered by either the oral or the intramuscular route. The pharmacokinetics are linear following single and multiple dosing. Steady state plasma levels are attained after one day of Q.I.D. dosing. Following oral administration, peak plasma concentrations of 0.7 to 1.1 µg/mL occur at an average of 44 minutes after a single 10 mg dose. The terminal plasma elimination half-life ranges between 2.4 and 9.0 hours in healthy adults, and between 4.3 and 7.6 hours in elderly subjects (mean age 72 yrs). A high fat meal decreases the rate, but not the extent, of absorption of oral ketorolac tromethamine. The use of an antacid has not been demonstrated to affect the pharmacokinetics of ketorolac. Following intramuscular administration, peak plasma concentrations of 2.2 to 3.0 µg/mL occur an average of 50 minutes after a single 30 mg dose. The terminal plasma half-life ranges between 3.5 and 9.2 hours in young adults and between 4.7 and 8.6 hours in elderly subjects (mean age = 72 years). In renally impaired patients there is a reduction in clearance and an increase in the terminal half-life of ketorolac tromethamine (see table below). The primary route of excretion of ketorolac tromethamine and its metabolites (conjugates and the p-hydroxy metabolite) is in the urine (91.4%) with the remainder (6.1%) being excreted in the feces. More than 99% of the ketorolac in plasma is protein bound over a wide concentration range. The parenteral administration of Toradol has not been demonstrated to affect the hemodynamics of anaesthetized patients.

THE INFLUENCE OF AGE, LIVER AND KIDNEY FUNCTION ON THE CLEARANCE AND TERMINAL HALF-LIFE OF TORADOL IM[1] AND ORAL[2]

TYPES OF SUBJECTS	TOTAL CLEARANCE (in L/h/kg)[3]		TERMINAL HALF-LIFE (in hours)	
	IM MEAN (range)	ORAL MEAN (range)	IM MEAN (range)	ORAL MEAN (range)
Normal Subjects IM (n=54) Oral (n=77)	0.023 (0.010-0.046)	0.025 (0.013-0.050)	5.3 (3.5-9.2)	5.3 (2.4-9.0)
Healthy Elderly Subjects IM (n=13), Oral (n=12) (mean age = 72, range = 65-78)	0.019 (0.013-0.034)	0.024 (0.018-0.034)	7.0 (4.7-8.6)	6.1 (4.3-7.6)
Patients with Hepatic Dysfunction IM and Oral (n=7)	0.029 (0.013-0.066)	0.033 (0.019-0.051)	5.4 (2.2-6.9)	4.5 (1.6-7.6)
Patients with Renal Impairment IM and Oral (n=9)(serum creatinine 1.9 - 5.0 mg/dL)	0.014 (0.007-0.043)	0.016 (0.007-0.052)	10.3 (8.1-15.7)	10.8 (3.4-18.9)
Renal Dialysis Patients IM (n=9)	0.016 (0.003-0.036)		13.6 (8.0-39.1)	

[1] **Estimated from 30 mg single IM doses of ketorolac tromethamine**
[2] **Estimated from 10 mg single oral doses of ketorolac tromethamine**
[3] **Litres/hour/kilogram**

INDICATIONS

Oral Route: Orally administered Toradol (ketorolac tromethamine) is indicated for the short-term management (not to exceed 5 days for post-surgical patients or 7 days for patients with musculoskeletal pain) of moderate to moderately severe acute pain, including post-surgical pain (such as general, orthopaedic and dental surgery), acute musculoskeletal trauma pain and post-partum uterine cramping pain. (See WARNINGS and DOSAGE AND ADMINISTRATION)

Intramuscular Route: Intramuscular injection of Toradol is indicated for the short-term management (not to exceed 2 days) of moderate to severe acute pain, including pain following major abdominal, orthopaedic and gynecological operative procedures. The total duration of combined intramuscular and oral treatment should not exceed 5 days.

CONTRAINDICATIONS

Hypersensitivity: Like other non-steroidal anti-inflammatory drugs, Toradol (ketorolac tromethamine) has been associated with hypersensitivity reactions. Toradol should not be used when there is a known or suspected hypersensitivity to the drug and should be discontinued in patients who develop symptoms of hypersensitivity during therapy. Because of the possibility of cross-sensitivity, Toradol should not be used in patients with the complete or partial syndrome of nasal polyps, angioedema, bronchospastic reactivity (e.g. asthma) or other allergic manifestations to acetylsalicylic acid (ASA) or other non-steroidal anti-inflammatory drugs. Severe and fatal anaphylactoid reactions have occurred in such individuals.

Gastrointestinal: Toradol should not be used in patients with suspected or confirmed peptic ulcer disease, gastrointestinal bleeding or perforation, or active inflammatory disease of the gastrointestinal system or in patients who have a history of these disorders. Severe and fatal reactions have occurred in such individuals.

Renal Impairment: Toradol is contraindicated in patients with moderate to severe renal impairment or in patients at risk for renal failure due to volume depletion.

Haemorrhagic Risk: Toradol is contraindicated immediately before any major surgery, and is contraindicated intraoperatively when hemostasis is critical because of the increased risk of bleeding. Toradol is also contraindicated in patients with coagulation disorders, postoperative patients with high haemorrhagic risk or incomplete haemostasis, and in patients with suspected or confirmed cerebrovascular bleeding.

Obstetrics: Toradol is contraindicated in labour and delivery because, through its prostaglandin synthesis inhibitory effect, it may adversely affect fetal circulation and inhibit uterine musculature, thus increasing the risk of uterine hemorrhage.

Neuraxial Administration: Toradol IM is contraindicated for neuraxial (epidural or intrathecal) administration due to its alcohol content.

Concomitant Medications: Toradol is contraindicated in patients currently receiving ASA or NSAIDs because of the cumulative risks of inducing serious NSAID-related adverse events. The concomitant use of Toradol and probenecid is also contraindicated.

WARNINGS

The long-term administration of Toradol (ketorolac tromethamine) is not recommended as the incidence of side-effects increases with the duration of treatment (see INDICATIONS and DOSAGE AND ADMINISTRATION). The most serious risks associated with NSAIDs including Toradol are:

Gastrointestinal Ulcerations, Bleeding and Perforation: Serious gastrointestinal toxicity, such as bleeding, ulceration, and perforation, can occur at any time, with or without warning symptoms, during therapy with non-steroidal anti-inflammatory drugs. The incidence of gastrointestinal complications increases with dosage and duration of treatment. Elderly and debilitated patients are more susceptible to these complications. To date, studies with NSAIDs have not identified any subset of patients not at risk for developing peptic ulceration and bleeding. Post-marketing experience with Toradol suggests that there may be a greater risk of gastrointestinal ulcerations, bleeding, and perforation in the elderly, and most spontaneous reports of fatal gastrointestinal events are in the aged population.

THE LONG-TERM USE OF TORADOL IS NOT RECOMMENDED.

Renal Toxicity: The following renal abnormalities have been associated with Toradol and other drugs that inhibit renal prostaglandin biosynthesis: acute renal failure, nephrotic syndrome, interstitial nephritis, renal papillary necrosis. Elevations of blood urea nitrogen (BUN) and creatinine have been reported in clinical trials with ketorolac tromethamine. Toradol is contraindicated in patients with moderate to severe renal impairment. Hypovolemia should be corrected before treatment with Toradol is initiated. Patients who are volume depleted may be dependent on renal prostaglandin production to maintain renal perfusion and, therefore, glomerular filtration rate. In such patients, the use of drugs which inhibit prostaglandin synthesis has been associated with further decreases in renal blood flow and may precipitate acute renal failure. Predisposing factors include dehydration (e.g. as a result of extreme exercise, vomiting or diarrhea associated with the loss of at least 5 to 10% of total body weight, unreplenished blood loss of approximately 500 mL), sepsis, impaired renal function, heart failure, liver dysfunction, diuretic therapy, and advanced age. Caution is advised if ketorolac tromethamine is used in such circumstances. Close monitoring of urine output, serum urea and serum creatinine is recommended until renal function recovers.

Fluid Retention and Edema: Fluid retention, edema, NaCl retention, oliguria, elevations of serum urea nitrogen and creatinine have been observed in patients treated with Toradol. Therefore, the possibility of precipitating congestive heart failure in elderly patients or those with compromised cardiac function should be considered. Toradol should be used with caution in patients with cardiac decompensation, hypertension or other conditions which cause a predisposition to fluid retention.

Haemorrhage: Postoperative haematomas and other symptoms of wound bleeding have been reported in association with the perioperative use of intramuscular Toradol. Toradol is contraindicated in patients who have coagulation disorders. If Toradol is to be administered to patients who are receiving drug therapy that interferes with haemostasis, careful observation is advised. Use of Toradol in patients who are receiving therapy that affects hemostasis should be undertaken with caution, including close monitoring. The concurrent use of Toradol and prophylactic, low dose heparin (2500-5000 units q12h), warfarin and dextrans may also be associated with an increased risk of bleeding (see DRUG INTERACTIONS). In patients receiving anticoagulants, the risk of intramuscular haematoma formation from Toradol IM injections is increased.

Hypersensitivity Reactions: The possibility of severe or fatal hypersensitivity reactions should be considered, even for patients with no known history of previous exposure or hypersensitivity to Toradol or other NSAIDs. Counteractive measures must be available when administering the first dose of Toradol IM. As with other NSAIDs, patients should be questioned for history of allergy to NSAIDs or ASA or for the syndrome consisting of nasal polyps, ASA allergy and asthma before being prescribed Toradol. Asthmatic patients with triad asthma (the syndrome of nasal polyps, asthma and hypersensitivity to ASA or other NSAIDs) may be at particular risk for severe hypersensitivity reactions.

Use in Pregnancy and Lactation: The administration of ketorolac tromethamine is not recommended during pregnancy or lactation. After 1 day at 10 mg q.i.d. oral dosing, Toradol has been detected in the milk of lactating women at a maximum concentration of 7.9 ng/mL.

Use in Children: Safety and efficacy in children have not been established. Therefore, Toradol is not recommended for use in children under age 16.

Use in the Elderly: Because ketorolac is cleared somewhat more slowly by the elderly (See PHARMACOKINETICS) who are also more sensitive to the gastrointestinal and renal effects of NSAIDs, (See WARNINGS and PRECAUTIONS) extra caution and the lowest effective dose (See DOSAGE AND ADMINISTRATION) should be used.

PRECAUTIONS

Physicians should be alert to the pharmacologic similarity of Toradol (ketorolac tromethamine) to other non-steroidal anti-inflammatory drugs that inhibit cyclo-oxygenase.

Gastrointestinal Effects: Close medical supervision is recommended in patients prone to gastro-intestinal tract irritation. In these cases, the physician must weigh the benefits of treatment against the possible hazards. Patients taking any NSAID including ketorolac tromethamine should be instructed to contact a physician immediately if they experience symptoms or signs suggestive of peptic ulceration or gastrointestinal bleeding. These reactions can occur at any time during the treatment. If peptic ulceration is suspected or confirmed, or if gastrointestinal bleeding occurs, ketorolac tromethamine should be discontinued and appropriate treatment instituted with close patient monitoring.

Hepatic Effects: Caution should be observed if Toradol is to be used in patients with impaired hepatic function, or a history of liver disease. Treatment with Toradol may cause elevations of liver enzymes, and in patients with pre-existing liver dysfunction, it may lead to the development of a more severe hepatic reaction. Meaningful elevations (greater than 3 times normal) of serum transaminases (glutamate pyruvate [SGPT or ALT] and glutamic oxaloacetic [SGOT or AST], occurred in controlled clinical trials in less than 1% of patients. If clinical signs and symptoms consistent with liver disease develop, or if systemic manifestations occur (e.g., eosinophilia, rash, etc.), ketorolac tromethamine should be discontinued. Patients with impaired hepatic function from cirrhosis do not have any clinically important changes in ketorolac tromethamine clearance. Studies in patients with active hepatitis or cholestasis have not been performed.

Hematologic Effects: Ketorolac tromethamine inhibits platelet function and may prolong bleeding time. It does not affect platelet count, prothrombin time (PT) or partial thromboplastin time (PTT). Unlike the prolonged effects from ASA the inhibition of platelet function by ketorolac tromethamine is normalized within 24 to 48 hours after the drug is discontinued. Blood dyscrasias associated with the use of NSAIDs are rare, but could occur with severe consequences.

Infection: In common with other non-steroidal anti-inflammatory drugs, ketorolac tromethamine may mask the usual signs of infection.

DRUG INTERACTIONS

Protein Binding: Toradol (ketorolac tromethamine) is highly bound to human plasma protein (mean 99.2%) and binding is independent of concentration. As ketorolac tromethamine is a highly potent drug and present in low concentrations in plasma, it would not be expected to displace other protein-bound drugs significantly. Therapeutic concentrations of digoxin, warfarin, acetaminophen, phenytoin, and tolbutamide did not alter ketorolac tromethamine protein binding.

Anticoagulant Therapy: Prothrombin time should be carefully monitored in all patients receiving oral anticoagulant therapy concomitantly with ketorolac tromethamine. Toradol IM given with two doses of 5000 U of heparin to 11 healthy volunteers, resulted in a mean template bleeding time of 6.4 min (3.2-11.4 min) compared to a mean of 6.0 min (3.4-7.5 min) for heparin alone and 5.1 min (3.5-8.5 min) for placebo. The *in vitro* binding of warfarin to plasma proteins is only slightly reduced by ketorolac tromethamine (99.5% control vs. 99.3%) at plasma concentrations of 5 to 10 µg/mL.

Digoxin: Ketorolac tromethamine does not alter digoxin protein binding.

Salicylates: *In vitro* studies indicated that, at therapeutic concentrations of salicylates (300 µg/mL), the binding of ketorolac tromethamine was reduced from approximately 99.2% to 97.5% representing a potential two-fold increase in unbound Toradol plasma levels.

Enzyme Induction: There is no evidence, in animal or human studies, that ketorolac tromethamine induces or inhibits the hepatic enzymes capable of metabolizing itself or other drugs. Hence, it would not be expected to alter the pharmacokinetics of other drugs due to enzyme induction or inhibition mechanisms.

Probenecid: Concomitant administration of ketorolac tromethamine and probenecid results in the decreased clearance of ketorolac and a significant increase in ketorolac plasma levels (approximately three-fold increase) and terminal half-life (approximately two-fold increase). The concomitant use of Toradol and probenecid is, therefore, contraindicated.

Furosemide: Ketorolac tromethamine reduces the diuretic response to furosemide by approximately 20% in normovolemic subjects.

Lithium: Some NSAIDs have been reported to inhibit renal lithium clearance, leading to an increase in plasma lithium concentrations and potential lithium toxicity. The effect of ketorolac tromethamine on lithium plasma levels has not been studied.

Methotrexate: The concomitant administration of methotrexate and some NSAIDs has been reported to reduce the clearance of methotrexate, thus enhancing its toxicity. The effect of ketorolac tromethamine on methotrexate clearance has not been studied.

ACE Inhibitors: Concomitant use of ACE inhibitors and other NSAIDs may increase the risk of renal impairment, particularly in volume depleted patients.

Morphine: Intramuscular Toradol has been administered concurrently with morphine in several clinical trials of postoperative pain without evidence of adverse interactions.

ADVERSE EVENTS

TORADOL TABLETS

Short-Term Patient Studies

The incidence of adverse reactions in 371 patients receiving multiple 10 mg doses of Toradol (ketorolac tromethamine) for pain resulting from surgery or dental extraction during the post operative period (less than 2 weeks) is listed below. These reactions may or may not be drug related.

Incidence Between 4 and 9%: Nervous System: Somnolence, insomnia. **Digestive System:** Nausea. **Incidence Between 2 and 3%: Nervous System:** Nervousness, headache, dizziness. **Digestive System:** Diarrhea, dyspepsia, gastrointestinal pain, constipation. **Body As A Whole:** Fever. **Incidence 1% or Less: Nervous System:** Abnormal dreams, anxiety, dry mouth, hyperkinesia, paresthesia, increased sweating, euphoria, hallucinations. **Digestive System:** Anorexia, flatulence, vomiting, stomatitis, gastritis, gastrointestinal disorder, sore throat. **Body As A Whole:** Asthenia, pain, back pain. **Cardiovascular System:** Vasodilatation, palpitation, migraine, hypertension. **Respiratory System:** Cough increased, rhinitis, dry nose. **Musculo-skeletal System:** Myalgia, arthralgia. **Skin & Appendages:** Rash, urticaria. **Special Senses:** Blurred vision, ear pain. **Urogenital System:** Dysuria.

Long-Term Patient Study

The adverse reactions listed below were reported to be probably related to study drug in 553 patients receiving long-term oral therapy (approximately 1 year) with Toradol.

Incidence Between 10 and 12%: Digestive System: Dyspepsia, gastrointestinal pain. **Incidence Between 4 and 9%: Digestive System:** Nausea, constipation. **Nervous System:** Headache. **Incidence Between 2 and 3%: Digestive System:** Diarrhea, flatulence, gastrointestinal fullness, peptic ulcers. **Nervous System:** Dizziness, somnolence. **Metabolic/Nutritional Disorder:** Edema. **Incidence 1% or Less: Digestive System:** Eructation, stomatitis, vomiting, anorexia, duodenal ulcer, gastritis, gastrointestinal haemorrhage, increased appetite, melena, mouth ulceration, rectal bleeding, sore mouth. **Nervous System:** Abnormal dreams, anxiety, depression, dry mouth, insomnia, nervousness, paresthesia. **Special Senses:** Tinnitus, taste perversion, abnormal vision, blurred vision, deafness, lacrimation disorder. **Metabolic/Nutritional Disorder:** Weight gain, alkaline phosphatase increase, BUN increased, excessive thirst, generalized edema, hyperuricemia. **Skin & Appendages:** Pruritus, rash, burning sensation skin. **Body as a Whole:** Asthenia, pain, back pain, face edema, hernia. **Musculo-skeletal System:** Arthralgia, myalgia, joint disorder. **Cardiovascular System:** Chest pain, chest pain substernal, migraine. **Respiratory System:** Dyspnea, asthma, epistaxis. **Urogenital System:** Hematuria, increased urinary frequency, oliguria, polyuria. **Hemic & Lymphatic** Anemia, purpura.

TORADOL IM

The adverse reactions listed below were reported in Toradol IM clinical efficacy trials. In these trials patients (N=660) received either single 30 mg doses (N=151) or multiple 30 mg doses (N=509) over a time period of 5 days or less for pain resulting from surgery. These reactions may or may not be drug related.

Incidence Between 10 and 13%: Nervous System: Somnolence. **Digestive System:** Nausea. **Incidence Between 4 and 9%: Nervous System:** Headache. **Digestive System:** Vomiting. **Injection Site:** Injection site pain. **Incidence Between 2 and 3%: Nervous System:** Sweating, dizziness. **Cardiovascular System:** Vasodilatation.

Incidence 1% or Less: Nervous system: Insomnia, increased dry mouth, abnormal dreams, anxiety, depression, paraesthesia, nervousness, paranoid reaction, speech disorder, euphoria, libido increased, excessive thirst, inability to concentrate, stimulation. **Digestive system:** Flatulence, anorexia, constipation, diarrhea, dyspepsia, gastrointestinal fullness, gastrointestinal haemorrhage, gastrointestinal pain, melena, sore throat, liver function abnormalities, rectal bleeding, stomatitis. **Cardiovascular system:** Hypertension, chest pain, tachycardia, haemorrhage, palpitation, pulmonary embolus, syncope, ventricular tachycardia, pallor, flushing. **Injection site:** Injection site reaction. **Body as a Whole:** Asthenia, fever, back pain, chills, pain, neck pain. **Special senses:** Taste perversion, tinnitus, blurred vision, diplopia, retinal haemorrhage. **Musculo-skeletal system:** Myalgia, twitching. **Respiratory system:** Asthma, cough increased, dyspnea, epistaxis, hiccup, rhinitis. **Skin and appendages:** pruritus, rash, subcutaneous hematoma, skin disorder. **Urogenital system:** Dysuria, urinary retention, oliguria, increased urinary frequency, vaginitis. **Metabolic/nutritional disorders:** edema, hypokalemia, hypovolemia. **Hemic and lymphatic system:** Anemia, coagulation disorder, purpura.

Postmarketing Experience

The following postmarketing adverse experiences have been reported for patients who have received either formulation of Toradol: **Renal Events:** Acute renal failure, flank pain with or without haematuria and/or azotemia, nephritis, hyponatremia, hyperkalemia, hemolytic uremic syndrome, urinary retention. **Hypersensitivity reactions:** Bronchospasm, laryngeal edema, asthma, hypotension, flushing, rash, anaphylaxis, and anaphylactoid reactions. Such reactions have occurred in patients with no prior history of hypersensitivity. **Gastrointestinal Events:** Gastrointestinal hemorrhage, peptic ulceration, gastrointestinal perforation, pancreatitis, melena. **Hematologic Events:** Postoperative wound haemorrhage, rarely requiring blood transfusion (see PRECAUTIONS), thrombocytopenia, epistaxis, leukopenia. **Central Nervous System:** Convulsions, abnormal dreams, hallucinations, hyperkinesia, hearing loss, aseptic meningitis, extrapyramidal symptoms. **Hepatic Events:** Hepatitis, liver failure, cholestatic jaundice. **Cardiovascular:** Pulmonary edema, hypotension, flushing. **Dermatology:** Lyell's syndrome, Stevens-Johnson syndrome, exfoliative dermatitis, maculopapular rash, urticaria. **Body as Whole:** infection.

OVERDOSAGE

In a gastroscopic study of healthy subjects, daily doses of 360 mg given over an 8-hour interval for each of five consecutive days (3 times the highest recommended dose) caused pain and peptic ulcers which resolved after discontinuation of dosing. Metabolic acidosis has been reported following intentional overdosage. Single oral doses of 200 mg have been administered to patients with no apparent serious side effects. Dialysis does not appreciably clear ketorolac from the blood stream.

DOSAGE AND ADMINISTRATION

Adults: Dosage should be adjusted according to the severity of the pain and the response of the patient. **Oral:** The usual oral dose of Toradol (ketorolac tromethamine) is 10 mg every 4 to 6 hours for pain as required. Doses exceeding 40 mg per day are not recommended. The maximum duration of treatment with the oral formulation is 5 days for post-surgical patients and 7 days for patients with musculoskeletal pain.

Intramuscular: The recommended usual initial dose is 10-30 mg, according to pain severity. Subsequent dosing may be 10 mg to 30 mg every 4-6 hours as needed to control pain. The lowest effective dose should be administered. The administration of Toradol IM should be limited to short-term therapy (not over 2 days). The total daily dose should not exceed 120 mg because the risk of toxicity appears to increase with longer use at recommended doses (see WARNINGS and PRECAUTIONS). The administration of continuous multiple daily doses of Toradol IM has not been extensively studied. There has been limited experience with intramuscular dosing for more than 3 days since the vast majority of patients have transferred to oral medication or no longer required analgesic therapy after this time.

If supplementary analgesia is required, a concomitant low dose of opiate can be used.

Patients Under 50 kg, Over Age 65 Years, or With Less Severe Pain at Baseline:

Oral: The lowest effective dose is recommended.

Parenteral: The lower end of the dosage range is recommended. The initial dose should be 10 mg. The total daily dose of Toradol IM in the elderly should not exceed 60 mg.

Impaired Renal Function:

Toradol is not recommended for patients with moderate to severe renal impairment.

Conversion from Parenteral to Oral Therapy:

Toradol tablets may be used either as monotherapy or as follow-on therapy to parenteral ketorolac. When Toradol tablets are used as a follow-on therapy to parenteral ketorolac, the total combined daily dose of ketorolac (oral + parenteral) should not exceed 120 mg in younger adult patients or 60 mg in elderly patients on the day the change of formulation is made. On subsequent days, oral dosing should not exceed the recommended daily maximum of 40 mg. Toradol IM should be replaced by an oral analgesic as soon as feasible. The total duration of combined intramuscular and oral treatment should not exceed 5 days.

Parenteral drug products should be inspected visually for particulate material and discoloration prior to use.

Toradol (ketorolac tromethamine) is a Schedule F drug.

Stability and Storage Recommendations

Toradol Tablets: Store at room temperature with protection from light.

Toradol IM: Store at room temperature with protection from light.

Availability of Dosage Forms

Toradol (ketorolac tromethamine) is available as 10 mg white round film coated tablets with one side printed in red with TORADOL inside bold T and other side with Syntex. Toradol (ketorolac tromethamine) 10 mg tablets are available in bottles of 100 and 500 tablets.

Toradol IM is available in 1 mL ampoules (trays of 10) containing 10 or 30 mg/mL.

Product Monograph available on request.

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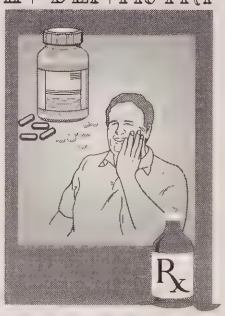
MEDICATION IN DENTISTRY



Effects Of a Chlorhexidine Varnish On the Gingival Status Of Adolescents

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ABSTRACT

The purpose of this blind study was to determine the effect of a two-stage chlorhexidine varnish, after three months, on the gingival status of 11- to 15-year-old children attending a school in Rio de Janeiro, Brazil. Subjects participating in the study were randomly allocated to control (C) and treatment (T) groups, n = 53 and n = 57, respectively. All subjects were matched at baseline on age, salivary levels of mutans streptococci, and caries scores. After elimination of carious lesions, a prophylaxis was given to both groups. The chlorhexidine varnish was then painted on the entire dentition of Group T subjects only. Prior to caries elimination, and again after three months, the gingival index was used to assess the gingival status of study subjects. An average of 106.6 ± 8.9 and 107.7 ± 6.2 gingival sites per subject (four sites per tooth) in Groups C and T, respectively, were examined by the same calibrated examiner on two occasions. For statistical purposes, data were dichotomized [(0,1) (2,3)] for the gingival index. Independent t-tests and paired t-tests were used to analyze the data. The percentage of sites per subject with scores of two or three at the baseline were balanced between study groups (3.7 ± 7.1 for T; 1.8 ± 3.2 for C; p = 0.08). After three months, a statistically significant decrease in the average percentage of sites with scores of two or three was demonstrated in the T group (0.7 ± 2.4, T, p < 0.0001; 1.3 ± 3.0, C, p < 0.25). The authors concluded that the application of a chlorhexidine varnish significantly improved the gingival health of T subjects for up to three months. A significant improvement in the gingival health could not be demonstrated in the C group.

SOMMAIRE

Cette étude a été réalisée pour évaluer, sur une période de trois mois, l'effet de deux applications topiques d'un vernis de chlorhexidine sur l'état gingival d'écoliers brésiliens de Rio de Janeiro, âgés de 11 à 15 ans. À l'insu des sujets, on les a répartis, au hasard, en deux groupes, témoin (C) et traitement (T), respectivement n = 53 et n = 57. Les variables de l'âge, la teneur salivaire en S. mutans, et l'indice de carie ont été contrôlées à une ligne de fond pour tous les sujets. Suivant l'élimination des caries, les deux groupes C et T ont subi une prophylaxie et le vernis de chlorhexidine a été appliqué sur la dentition complète des sujets du groupe T. En moyenne, 106,6 ± 8,9 C et 107,7 ± 6,2 T sites gingivaux/sujet (4 sites/dent) ont été examinés suivant un procédé standardisé. Le test-t a été employé pour l'analyse de donnés selon les normes statistiques. Les sites touchant [(0,1) (2,3)] de l'indice de la gingivite ont été partagés entre les deux groupes (3,7 ± 7,1, T, 1,8 ± 3,2, C; p = 0,08) à ligne de fond. Après trois mois on a constaté une réduction statistiquement significative des sites touchant (2,3) de l'indice de la gingivite dans le groupe T comparativement au groupe C, où aucune réduction significative a été notée (0,7 ± 2,4, T, p < 0.0001; 1,3 ± 3,0, C, p < 0,25). On peut donc conclure qu'une amélioration significative de l'état gingival a été notée trois mois après l'application topique d'un vernis de chlorhexedine chez les sujets du groupe T. Les sujets du groupe C n'ont démontré aucune amélioration significative de l'état gingival.

Introduction

The relationship between the accumulation of dental bacterial plaque and the development of gingivitis has been es-

tablished.[1] Chlorhexidine preparations, mainly mouthrinses, have been shown to be effective in plaque control and in the control of gingivitis.[2-4]

In recent years, topically applied, sustained release varnishes have become available for the suppression of caries-associated flora, i.e., the mutans streptococci.[5-10] A number of clinical studies have been conducted using chlorhexidine varnishes to suppress the number of mutans streptococci in plaque and saliva.[9-17] However, these studies did not look at the possible additional benefits of chlorhexidine varnishes on gingival status.

The purpose of this study was to determine the effect of a two-stage chlorhexidine varnish, applied on the entire dentition, on the gingival status of adolescents after three months.

Material and Methods

One hundred and ten girls, 10 to 15 years of age, attending a school in Rio de Janeiro, Brazil, participated in the study. Subjects were randomly allocated to control (C) and test (T) groups, n = 53 and n = 57, respectively. All subjects were matched at baseline on age, salivary levels of mutans streptococci, and caries scores (the results from these caries trials will be described in detail elsewhere). After eliminating all carious lesions, a prophylaxis was given to children in both groups. Subsequently, a two-stage 10 per cent chlorhexidine varnish (Chlorzoin) was applied to the entire dentition of Group T subjects only. One subject from Group T presented with desquamated ulcerative gingival lesions. This individual had a history of multiple allergies, however.

To assess the gingival status of all subjects, each participant's gingival index[7] was recorded by a calibrated examiner (MIV) prior to caries elimination, and again three months after varnish application. Four sites per tooth were examined with a periodontal probe, and the subjects' gingival status was assessed based on four specific criteria:

Table I

Effects Of a Chlorhexidine Varnish On the Gingival Status Of Adolescents After Three Months

Group	n	Per Cent Sites Gingival Index (2,3)	
		Baseline	Three Months
Treatment	57	$p < 0.001$ 3.7 ± 7.1[a] ↔ ↕ NS	0.7 ± 2.4 ↕ NS
Control	53	NS 1.8 ± 3.2 ↔	1.3 ± 2.9

a) mean ± SD
NS — not significant

0 = Absence of signs of inflammation.

1 = Mild to moderate inflammatory gingival changes, not extending around the tooth.

2 = Mild to moderately severe gingivitis extending all around the tooth.

3 = Severe gingivitis characterized by marked redness, swelling, tendency to bleed and ulceration.

An average of 106.6 ± 8.9 (mean ± standard deviation) gingival sites per subject in Group C and 107.7 ± 6.2 in Group T were examined on both occasions. For statistical purposes, the gingival index data were dichotomized [(0,1) (2,3)], and analyzed with independent t-tests and paired t-tests.

Results

Table I depicts the average percentage of sites per subject in Groups T and C with a gingival index score of two or three at baseline, and three months after the application of a chlorhexidine varnish. As can be seen, the average percentage of sites per subject with a gingival index score of two or three was balanced between Groups T and C at baseline ($p = 0.08$) (**Table I**). The percentage of subjects having at least one site with a gingival index of two or three at baseline was 57 per cent for Group C and 46 per cent for Group T. Three months after the varnish was applied, a statistically significant decrease in the mean percentage of sites per subject with scores of two or three was demonstrated in Group T ($p < 0.0001$), whereas no significant reduction in the mean percentage of sites with scores of two or three was observed in Group C (**Table I**).

Discussion

Clinical studies of chlorhexidine varnishes have primarily looked at their effects on the cariogenic flora, i.e., mutans streptococci. A few studies[6,8,18] have reported the effects of chlorhexidine varnishes on plaque accumulation. One study[18] showed significant reductions in plaque scores for the buccal surfaces of maxillary teeth (canines and pre-molars) after 72 hours. Similarly, Friedman et al[6] achieved significant reductions in the plaque scores of eight dental students, for a period of four days, by painting a chlorhexidine varnish on removable appliances. Although varnish treatment did not affect the plaque scores of abutment teeth in patients with overdentures,[8] this is not surprising, given that only a drop of the varnish was applied on the abutment teeth on a single occasion prior to the insertion of the precision-attachment overdentures. One would expect, therefore, a reduction in plaque scores to result in an improvement of gingival health.

Our caries clinical trials have allowed us to study the effects of chlorhexidine varnishes on salivary mutans streptococci, caries rates and gingivitis, concomitantly. The observed improvement in the gingival status of Group T subjects participating in this study did not come as a surprise, because chlorhexidine rinses and gels have been successfully used in caries and gingivitis control programs.

Chlorhexidine mouthrinses have been widely used in the prevention and control of plaque and gingivitis. The chief complaints associated with their use relate to their undesirable taste and their tendency to stain tooth surfaces.

The sustained-release chlorhexidine varnish used in this study is applied in two stages:

1) A thin layer of a natural resin, with added chlorhexidine, is initially applied on the entire dentition and allowed to dry;
2) A second layer, consisting of a protectant varnish that results in the drug being released over time, is subsequently applied and allowed to dry.

This mode of application prevents both undesirable taste and clinical staining — the relevant characteristics required for patient acceptance of antimicrobials, especially in children and adolescents. Moreover, it eliminates the need for patient compliance, since it is professionally administered.

This study has demonstrated that the application of a chlorhexidine varnish on the entire dentition significantly improved the gingival health of subjects for up to three months posttreatment. A significant improvement in the gingival health could not be demonstrated in a control group (Group C), which did not receive chlorhexidine varnish. We are currently determining the long-term effects of chlorhexidine varnish on the gingival status of study participants. ■

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DID YOU KNOW?

XXX Sealed With A Kiss

The symbols, XXX, as we know them, stand for kisses. In the Middle Ages, when the vast majority of people were illiterate, X, was used as a signature.

Along with legal symbolism, X also was a symbol of Christianity. The X was the sign of St. Andrew, and signing the X implied a guarantee to live up to one's promises in that saint's name.

It seems the X became a romantic symbol when it guaranteed the sincerity of intentions. The people in the Middle Ages solemnly kissed their signatures. The kiss became known as the "kiss of truth," such as kissing the Bible under oath, and later letters were "sealed with a kiss," XXX.

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The New Year brings a fresh outlook and new frontiers ...

1996 has arrived! The start of a new year brings with it a renewed determination to do great things and to make changes for the better. This is exactly what the CDA Convention department has been striving to do. With your help we have been planning the 1996 Convention with a fresh outlook and an eagerness to explore new frontiers. Consequently, we are ready to unveil a new format for the Montréal Convention; one that we believe will be beneficial to our members and the dental professionals of Canada.

The 1996 CDA Convention dates are Saturday, August 17 to Tuesday, August 20. Saturday and Sunday are designed for pre-convention lectures and workshops with the Convention proper commencing on Monday. The scientific program has been remodeled to better suit your needs. Firstly, we have invited a greater percentage of Canadian lecturers to be a part of our '96 speaker platform. This will address topics with greater content directed toward Canadian dental professionals as well as give greater exposure to our Canadian talent.

Secondly, a greater number of lectures with a shorter time frame of 1 1/2 hours have been planned to give more variety and enable participants to attend more lectures in one day if they so choose. We will still offer half day and full day lectures for those who prefer this format. Thirdly, being in Montréal this year we'd like to accommodate more francophone participants in the scientific program. Therefore, while the majority of sessions will be given in English, more French lectures will be added.

Also new this year, we'd like to help your days begin in the right direction. We will be inviting participants to muffins and coffee on Monday and Tuesday. There they will have an opportunity to mingle in a relaxing and upbeat atmosphere as lively music is played in the background.

Following breakfast, we have planned for a keynote speaker to give a motivational presentation to registered participants. This talk will be given by a well-known celebrity who will speak on a topic of general interest. The message will be inspiring and will remain with us as we go on in our lives. We anticipate that these two early events will be great beginnings to your mornings.

The creative wheels are still churning and we'll keep you posted on any further developments to the '96 Convention program. Your preliminary program will be arriving in the mail soon. Plan now to join us in Montréal from August 17-20 for a new and exciting meeting.

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From August 17 - 20, 1996 the city of Montréal will play host to the annual Canadian Dental Association Convention. Dental professionals from all over the country will have the opportunity to experience the Québécois hospitality. You will find below a list of hotels we have selected for the meeting as well as a short description that will help you in making your selection.

Montréal Bonaventure Hilton

Built directly on the roof of Place Bonaventure where the Convention and Trade Exhibits will take place, this headquarter hotel will also serve as a venue for the scientific program. The Montréal Bonaventure Hilton offers all the luxuries of a resort hotel while being located in the city's centre and at the heart of all the action. Its gorgeous 2 1/2 acres of gardens, blossoming trees, streams filled with goldfish and resident pheasant and ducks make this penthouse hotel an oasis of freshness in the heart of Montréal.

Montréal Marriott Château Champlain

The former Château Champlain hotel has only been recently acquired by the Marriott chain and it has undergone a series of major renovations to meet the standards of excellence which is a trademark of all the Marriotts worldwide. Only a block away from Place Bonaventure, the hotel is a perfect reflection of Montréal's unique flavour. Just minutes from its doors, you can explore the past in Old Montréal or stroll among the city's eclectic clubs and bistros. The Montréal Marriott Château Champlain also boasts of a fully-equipped spa that will revive and refresh even the most weary Convention delegate.

Novotel Montréal

Situated right in the heart of downtown approximately 7 minutes walking distance from Place Bonaventure, this European-style hotel will appeal to those travelling on a budget. With a policy of two children under 16 sharing a parent's room for free and receiving a complimentary breakfast in the Café Nicole, the Novotel Montréal offers all the amenities that will make your stay most enjoyable.

Radisson Gouverneurs Montréal

Located directly across the street from Place Bonaventure, the Radisson Gouverneurs Montréal offers a wide range of guestrooms with an accent on comfort, calm and good taste. Fitness enthusiasts have full access to the hotel's gym, sauna, pool and Nautilus. In the bar, Chez Antoine bistro decorated in the romantic Belle Epoque style, or in the magnificent revolving rooftop Tour de Ville restaurant, you will find the atmosphere of friendly Old World charm so characteristic of Québec.

The Queen Elizabeth Hotel

Quietly elegant, warm and friendly, The Queen Elizabeth hotel is a landmark in the heart of Montréal's vibrant cultural and commercial centre. After a busy day at the Convention or exploring the city's historic sights, the hotel offers you a most comfortable retreat where you can enjoy fine dining in the relaxing ambience of Le Montréalais or in the world-renowned Beaver Club. The Queen Elizabeth is adjacent to Place Ville Marie, Central Station (across the street from Place Bonaventure) and has access to the underground city.

In a few weeks you will receive a Preliminary Program with Enrolment and Hotel Accommodation forms. Should you need any information at this time, please call CDA Conventions at 1-800-267-6354.

For You and Your Team ...

At CDA '95 many dental teams were able to reap the benefits of attending the Convention together.

For 1996, we'd like to continue with our dental team package. Therefore, since CDA members register for free to the Annual Convention as part of their membership benefit, we are also making it affordable for dental team members. **Once again, every dentist who pre-registers may enroll two non-dentist staff members for free!**

1995 Convention Survey Winners

To those of you who participated in the 1995 post-convention survey, we say "Thank you!"

With the surveys in and the draw container tumbling, we drew names for the five gifts.

The lucky winners were:

Dr. Martin Dveris, Winnipeg, MB

Dr. Donald Fraser, Riverview, NB

Dr. Rachna Minocha, Amherst, NS

Dr. Alexander Spira, Montréal, QC

Dr. David Tsujikawa, Edmonton, AB

Each winner was sent a fabulous travel clock-radio — and just in time for the holidays!

TABLE CLINICS

An Interactive Learning Experience

A table clinic is a concise 10-minute presentation surrounding a table display. It is an opportunity for you to share with your peers improvements made to a clinical procedure, research findings or a general overview on a topic of dentistry of interest to you. Table clinics also involve interaction with your audience as it is encouraged that others ask questions about your presentation.

The CDA Convention Table Clinic Program is for both the novice and experienced dental professional. If you like to share dental information with your colleagues then presenting a table clinic is for you.

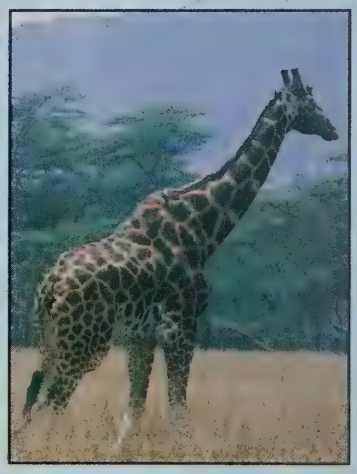
You might also consider co-presenting a table clinic with a friend or colleague.

For more information, contact CDA Conventions at 1-800-267-6354.

Out-of-Country Seminars

South Africa (May 3 - 16, 1996)

Designed for CDA member dentists, this out-of-country Seminar will be an enchanting trip. In addition to dental seminars and visits to clinics, the nature and wildlife of South Africa await you. It is a land of urbanization and industrialization juxtaposed to hardy and robust wildlife roaming freely within its borders. It is the contrasts within these borders that truly make it a world within one country.



The following descriptions are only tour highlights:

Pretoria

Enjoy brunch at the unusual Heia Safari Ranch, then tour the stately Union building, Opera House and Voortrekker Monument.

Kruger National Park

Professional guides consisting of rangers and trackers will take you to one of the most exceptional private game lodges. Open safari vehicles are the mode of transport for going on a game drive. Another outing will take you on a nature walk with a naturalist guide, remember to keep an eye out for the "Big Five" — Elephant, Leopard, Lion, Buffalo and Rhino.

Plettenberg Bay

Venture on an overland journey on route to Plettenberg Bay via the Garden Route, the Eastern Cape, Tsitsikamma Forest and Mountains and by crossing the Bloukraans and Groot River passes.

Knysna

The wilderness of Knysna envelopes visitors with its rich intertidal life, varied coastal vegetation and numberous species of birds.

Oudtshoorn

To arrive at this semi-desert area you'll cross the Outeniqua Mountain Pass. See the largest flightless bird in the world — the Ostrich, then explore the great limestone caverns of the Cango Caves.

Cape Town

Cape Dutch architecture will be found in Barrydale and Swelledam. Travel through the orchards of Caledon then on to Cape Town. Here a myriad of city tours will take you to museums, cathedrals, gardens and weather permitting a cable car ride to Table Mountain.

For more information on the Out-of-Country seminars and on the Pre- and Post Congress tours complementing the FDI World Congress, please call CDA Conventions at 1-800-267-6354.

FDI 1996 Congress & Tours

84th Annual World Dental Congress in Orlando, Florida

From September 28 to October 1, 1996, the American Dental Association will host the FDI World Dental Congress in one of the most popular tourist spots in the world — Orlando, Florida. Dental professionals from around the world will gather for an educational program featuring world-renowned lecturers. They will also congregate in Orlando for a week of socializing and sheer enjoyment proffered by this city of magic and delights.

Enjoy worry-free travel plans and join the Canadian Delegation to the FDI Congress. While in Orlando, you will stay at the deluxe 5-star Castle Hotel (Holiday Inn Select). Located within walking distance to the Orange County Convention Center, this hotel is sure to charm you with its magical setting.

In cooperation with Tourcan Vacations, the Canadian Dental Association has devised a series of pre- and post-congress tours complementing the FDI World Dental Congress.

Gulf of Mexico Cruise *(September 23-27)*
This four-day cruise is the perfect answer for those who want to spend the days leading to the FDI Congress soaking up the sun and relaxing. Departing from your home airport, you will land in Miami where you will board the Carnival Cruiseline's Funship "Ecstasy". You will then proceed to Key West and to the magnificent Playa Del Carmen and Cozumel, a Mexican paradise for underwater adventurers. You will then return to Orlando in time to attend the Congress before your flight home.

Walt Disney World *(October 2-6)*
If your family is accompanying you to Orlando, there is no doubt that you'll want to visit Disney World. Enjoy four fun-filled days at the Magic Kingdom, Epcot Center and Disney-MGM Studios. Shop at the Disney Village Marketplace while staying in one of Disney's Resort properties.

Galapagos *(October 2-10)*
If you love nature and adventure, welcome to the Galapagos. Located 600 miles off the coast of Ecuador, the island is rich in reptile, bird and marine life. There, you will also find 500-pound tortoises and pre-historic iguanas. You will walk, swim and snorkel with the animals and see plant life that is found nowhere else in the world. Finally, on this nine-day tour, you will visit Quito, Ecuador's capital, a city of cobblestone streets, ancient Spanish churches and museums filled with golden treasures.

Costa Rica *(October 2-11)*
This lush Central American country of immense rain forests, volcanoes and whitewater rapids will thoroughly delight you. Your 10-day visit will certainly prove too short to enjoy all that the country has to offer. National parks with one of the deepest active volcanoes in the world, a Wildlife Refuge harbouring Jaguars to Kingfishers, over 20,000 hectares of tropical rain forests and finally whitewater rafting in an area at close proximity to a macadamia nut farm.

Also, if you wish to pre-register for the FDI Congress, call CDA Conventions and we will forward you a Preliminary Program complete with a Registration Form.

FDI 1995 Pre- and Post-Congress Tour Highlights —

Hong Kong, China and Bunga Raya

In 1995, the Canadian Dental Association together with Tourcan Vacations, offered exciting tours complementing the FDI 1995 World Dental Congress in Hong Kong. Dentists from all over the country participated in the tours to Singapore, Malaysia, Bangkok, China, Thailand and Hong Kong.

China:

For a whole week before FDI 1995, a group of participants toured mainland China. There, travellers had the opportunity to visit the cities of Bejing, Xian and Guilin. In Bejing, those not fearing heights climbed the breathtaking Great Wall of China, a truly unforgettable experience. In a city of 12 million people where 3 million cyclists continually mingle with pedestrians and motor vehicles, it is amazing to watch the masses move with utmost efficiency. Amazing also with such traffic is that all came out unscathed!

In the city of Xian, the participants were awed by a great wonder of the Ancient World. In this city, thousands of life-size terracotta warriors were discovered just decades ago. These warriors, all created with individual features, stand at attention in military position, some with horses, some seemingly awaiting orders to attack. The last stop on the agenda was Guilin, an area famed for its quaint villages and scenic cruises down the Li Jiang River. Throughout the trip the group enjoyed first class accommodation, superb Chinese cuisine and wonderful hospitality.

Hong Kong:

After landing in Hong Kong, a somewhat harrowing experience since runways appear couched between rows of buildings, one is amazed at the vast number of highrises. What is truly astonishing is that most of the newer structures are erected on reclaimed land. One such building is the Convention Center where the Hong Kong Dental Association hosted the 83rd World Dental Congress. After the excellent scientific sessions, participants had the opportunity to take in the sights of neighbouring Kowloon, apprising the wares of street vendors and the goods offered in the most exclusive boutiques. In Hong Kong one has to shop, right?

Singapore, Malaysia and Thailand:

Fresh from the FDI Congress, twenty Canadian delegates and their partners set out to discover the wonders of the Orient on the eleven-day Bunga Raya Tour. This was a wonderful way to capture the flavor of the Orient with interesting and exciting visits to Singapore, north through Western Malaysia, Bangkok and Thailand. As the official flower of Malaysia, the Bunga Raya, or hibiscus, mirrored the beauty of an exciting holiday of interesting sites, good food and tasteful accommodation.

In the words of a participant, "The highlights of our tour included discovering the excitement of Singapore's Chinatown and Little India, visiting the thriving city of Kuala Lumpur, winding our way through the dense jungles, mountains and tea plantations of the Cameron Highlands, relaxing at the luxurious Mutiara Beach Resort in Penang and testing our bargaining skills in the shops and markets of Bangkok". (We arrived with twenty suitcases and left with thirty).

The participants' knowledge of Malaysia was enhanced with visits to Buddhist, Hindu and Chinese temples, mosques and burial grounds and the mysterious Batu Caves. As they continued their journey into Thailand, the travelers were entertained by colourful native dancers and a friendly elephant show. A spectacular tour of the Grand Palace in Bangkok, with its magnificent fluted spires and golden domes left many in awe.

Again in the words of one of the participants: "As our tour came to an end, our group of 20 had become somewhat of a family with new friendships formed and with dreams of visits to other exotic locales dancing through our heads."

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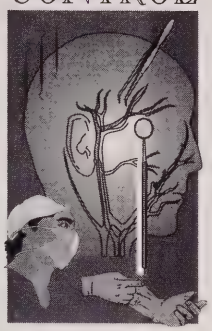

Attitudes and Behavior Of HIV-Infected Patients Concerning Dental Care

Gillian M. McCarthy, BDS, M.Sc.
Feisal S. Haji, B.Sc.
Iain D.F. Mackie, MD, FRCP

ABSTRACT

This preliminary, descriptive study investigated the behavior and attitudes of HIV-infected patients concerning dental care. A self-administered, anonymous questionnaire was completed by 101 of 102 consecutive HIV-infected adults (mean age 36 years). Since the diagnosis of HIV infection, 81 respondents reported that they had sought dental care; 54 reported visiting a dentist at least once a year; 41 had changed dentists; and 62 reported current mouth problems, for which 45 were receiving treatment.

Forty per cent of all respondents were receiving treatment in a hospital dental department. The use of hospital facilities was not associated with advanced HIV disease. Seventy per cent of participants were satisfied with the dental treatment they had received since they were diagnosed with HIV (18 per cent had no opinion, and 12 per cent were dissatisfied). Twelve per cent were concerned that their HIV seropositivity would not be kept confidential. While 87 per cent of participants had disclosed their HIV-seropositivity to their current dentist, 29 per cent believed that the dentist could be reluctant to provide treatment if they did so. Some patients reported changing dentists or not seeking care based on their fear that dentists would be reluctant to provide treatment. Fifteen per cent of patients who had sought dental care reported that they were refused treatment because they had HIV.

Participants were more likely to have received dental care within the previous year if they reported being able to afford treatment, or had dental insurance ($p < 0.01$). Because more than 33 per cent of respondents had incomes below the poverty line, it is likely that economic factors limit the access to dental care for patients with HIV. More research is required using a larger sample and a random selection of participants.

SOMMAIRE

Cette étude préliminaire et descriptive examine le comportement et les attitudes des patients séropositifs face aux soins bucco-dentaires. On a demandé à 102 adultes séropositifs, dont la moyenne d'âge était de 36 ans, de remplir l'un après l'autre et de façon anonyme un questionnaire; 101 ont répondu. Depuis qu'on a diagnostiqué leur séropositivité, 81 répondants disent avoir recherché des soins bucco-dentaires; 54 consultent le dentiste au moins à tous les ans; 41 ont changé de dentiste; et 62 ont dit avoir actuellement des problèmes bucco-dentaires, mais 45 d'entre eux se font soigner.

Quarante pour cent des répondants fréquentent un service dentaire hospitalier. On n'a pas associé la consultation des centres hospitaliers au progrès de la maladie. Soixante-dix p. cent se disent satisfaits des soins qu'ils reçoivent depuis qu'on a diagnostiqué leur maladie (18 p. cent n'ont pas d'opinion et 12 p. cent se disent insatisfaits). Douze p. cent craignent qu'on ne garde pas la confidence au sujet de leur séropositivité. Si 87 p. cent ont informé leur dentiste de leur état, 29 p. cent craignent que le dentiste hésitera de les soigner s'ils l'informent. Certains patients disent avoir changé de dentiste ou ne pas chercher à en consulter un, par crainte que le dentiste hésite à les soigner. Quinze p. cent de ceux qui ont cherché à se faire soigner les dents indiquent qu'on leur a refusé les soins à cause de leur séropositivité.

Les participants qui ont dit en avoir les moyens ou qui sont assurés ($p < 0,01$) ont plus probablement reçu de soins bucco-dentaires au cours de la dernière année; mais, comme plus du tiers des répondants ont un revenu en-deçà du seuil de pauvreté, il est probable que ce sont les facteurs économiques qui empêchent les patients séropositifs d'avoir pleinement accès aux soins dentaires. Il faudra poursuivre la recherche avec un échantillonnage plus grand de participants choisis au hasard.

Introduction

The human immunodeficiency virus (HIV) has had a major impact on the delivery of

health care, including dental services. Health-care professionals have reassessed both infection control procedures,[1-3] and the ethics of providing care to patients with infectious diseases, including HIV.[4,5] Although public and professional concerns have focused on HIV, it is recognized that the hepatitis B virus (HBV) is more infectious and presents a greater hazard in the health-care environment.[3,6,7]

The annual incidence of HIV/AIDS cases in Canada is rising[8] — current estimates indicate that 40,000 to 42,000 Canadians are infected with HIV. It is anticipated that the number of HIV-infected patients seeking dental care will also increase and dentists can play an important role in the detection of oral lesions that can contribute to the early diagnosis of HIV infection.[9] However, many health-care workers, including dentists, have concerns regarding the treatment of these patients. These include fear about their personal safety, difficulty dealing with staff fears, and loss of non-HIV infected patients from the practice if it becomes known that care is being provided to HIV-infected patients.[10-12] As a result, many dentists are reluctant to treat patients with HIV.

Previous reports indicate that the provision of general dental care to HIV-seropositive individuals involves no more complications than the provision of comparable care to non-infected patients.[13] Therefore, providing recommended infection control procedures are followed, patients with HIV, who are not medically compromised, can be safely treated in the dental office. On the other side of the coin, professional recommendations on infection control procedures — including the use of universal precautions — reinforce the ethical obligation of all dentists to provide care for patients with infectious diseases, including HIV. In its *Statement On the Ethical and Legal Considerations Of Treating Patients With Infectious Diseases*, the Canadian Dental Association states that: "Dental treatment can and should be rendered in the dental office to most patients with infectious diseases, since their safe treatment simply requires following established communicable disease protocols, and taking routine precau-

Table I

Characteristics of Study Population (n = 101)

Characteristics		Frequency
Gender (males)		92
Post-secondary education		50
Unemployed		61
Full dental insurance		15
Partial dental insurance		13
Annual income (< 20,000)		59
Risk group (homosexual)		62
Diagnosed with AIDS		18
CD4+ lymphocyte count:	> 500 cells/mm^3	17
	200-500 cells/mm^3	28
	< 200 cells/mm^3	47
	Don't know	8

Mean age 35.9 years (range 21 to 64).

Table II

Behavior of HIV-Infected Patients Concerning Dental Treatment

Category		Frequency	
		n	per cent
Before HIV diagnosis:	Regular dentist	61/101	60.4
	Dental visit at least once a year	56/101	55.4
Since diagnosis of HIV:	Dental visit at least once a year	54/101	53.5
	Refusal for dental treatment	12/ 81	14.8
	Changed dentist	41/81	50.6
	Receiving treatment for current mouth problem*	45/101	44.6
	Non-disclosure of HIV status to current dentist	10/77	13.0

No patients reported refusal for treatment before diagnosis of HIV.
** 62 respondents reported current mouth problems.*

Table III

HIV-Infected Patients' Reasons for Changing Dentists Since Diagnosis of HIV (n = 41)

Category	Frequency	
	n	per cent
Referred by dentist	7	17.1
Referred by physician	7	17.1
Dentist refused treatment	6	14.6
Feared rejection	10	24.4
Feared loss of confidentiality	4	9.7
Dentist reluctant to treat	4	9.7
Patient moved	12	29.2
Wanted dentist who was familiar with HIV infection	1	2.4

Some patients had more than one reason.

tions to protect the dentist, the staff, and other patients who attend the office."[4]

The objectives of this preliminary, descriptive study were to investigate the behavior and attitudes of HIV-infected patients toward dental care, and to identify obstacles to the provision of dental care to patients with HIV.

Methods

The study population included 101 consecutive HIV-seropositive patients attending the London HIV-Care Program in Southwestern Ontario. Patients who were less than 18 years of age and those who were unwilling or unable to provide informed consent were excluded from the study.

The study instrument was an anonymous, pre-tested, self-administered questionnaire that included open-ended questions to obtain additional input from the respondents. Twenty people participated in the preliminary test-retest to determine the reliability of the questionnaire. Questions scoring a kappa statistic of less than 0.4 were eliminated and other questions were added. The final questionnaire was assessed with a second test-retest procedure, which was administered to an additional 20 HIV-infected patients. The kappa statistic ranged from 0.6 to 1.0, indicating moderate to excellent reliability.[14] The 39 questions contained in the final questionnaire sought sociodemographic data, as well as information on the patients' dental experiences before and after diagnosis of HIV-infection, and their attitudes to dental care.

Descriptive statistics were obtained using the Statistical Package for the Social Sciences (SPSS). Pearson's chi-square test with continuity correction was used to identify significant differences between outcome and predictor variables.

Results

Of the 102 patients asked to participate in the survey, one patient declined because he was too ill (99 per cent response rate). **Table I** shows the characteristics of the study population. Respondents reported a mean age of 36 years, with the majority aged between 30 and 39 years. Ninety-two respondents were male, and 62 had acquired HIV through homosexual activity. Fifteen per cent had university degrees and 50 per cent had post secondary education. Approximately one-quarter of the respondents had either full or partial dental insurance coverage, and 36 per cent received social assistance. One-third of respondents earned less than $10,000 (Canadian) per year, and 61 per cent were unemployed. Fifty-eight per cent of respondents reported that they were well, 23 per cent were HIV-seropositive but did not have AIDS, and 18 per cent reported that they had been diagnosed with AIDS. Nearly half of the respondents had a CD4+ lymphocyte count (T4 count) of < 200 cells/mm^3. The CD4+ lymphocyte (T4) count is used as an indicator of the progression of HIV disease, and normally ranges from 750 to 1,000 cells/mm^3.[15]

The behavior of respondents concerning dental treatment is shown in **Table II**. About half of all respondents had visited a dentist at least once a year since being diagnosed with HIV. Sixty-one per cent reported current mouth problems for which 45 per cent were receiving treatment. Eighty-one participants had visited a dentist subsequent to having been diagnosed with HIV. Of these, 51 per cent had changed dentists and 15 per cent had been refused dental treatment by at least one dentist. When treatment was denied, all respondents believed that the refusal was due to their HIV infection. The reasons reported for changing dentists are shown in **Table III**.

Thirteen per cent of respondents had withheld the fact that they were HIV-seropositive from their current dentist. A further 18 per cent had not sought dental care. Of these, four could not afford treatment, one was concerned that a dentist may refuse to treat him or her, three did not want any more people to know about their HIV infection, and two did not want to transmit HIV.

The attitudes of the respondents concerning dentists and dental care are shown in **Table IV**. Seventy per cent of patients were satisfied with the dental care they had received since HIV diagnosis, and only 12 per cent were dissatisfied. Sixty-three per cent of respondents reported that they would get better dental care if their dentist knew about their HIV status, and 79 per cent were comfortable telling their dentist that they were infected with HIV. Eighty per cent of respondents believed that their HIV status would be kept confidential if they informed their dentist that they were HIV positive, and 12 per

Table IV

Attitudes of HIV-Infected Patients Concerning Dental Care

Attitude	Frequency (per cent)		
	Agree	No Opinion	Disagree
I will get better dental care if my dentist knows that I have HIV	55(63)	23(26)	9(10)
HIV status will be kept confidential if I tell my dentist that I have HIV	78(80)	8(8)	12(12)
My dentist is comfortable providing care	72(77)	19(20)	2(2)
I am satisfied with the dental care that I have received since I became HIV-positive	64(70)	16(18)	11(12)
If I tell my dentist that I have HIV, he/she will be reluctant to treat me	24(29)	16(19)	44(52)
I have confidence in my dentist's ability to deal with HIV-related mouth problems	51(64)	24(30)	5(6)
I am comfortable telling my dentist that I have HIV	67(79)	2(2)	16(19)

Additional comment: dentists have a right to know for their own safety.[1]

cent disagreed. Sixty-four per cent reported that they had confidence in their dentist's ability to deal with HIV-related mouth problems. Twenty-nine per cent of respondents believed their dentist would be reluctant to treat them if they disclosed that they were HIV positive. Sixty-two respondents reported mouth problems, most frequently thrush (**Table V**). Other mouth problems included three reports of hairy leukoplakia and single reports of problems from wisdom teeth, a fractured tooth, soreness on chewing, an infected root canal, inflammation of tongue and mouth, other gum problems, mouth sores, and a need for cleaning.

Discussion

The majority of respondents reported current mouth problems, but nearly one third of these patients were not receiving treatment. Some respondents had not sought dental care since diagnosis of HIV infection; some reported that they did not need to visit a dentist, while others reported economic or HIV-related reasons, including fear of rejection and the consequences of disclosing their HIV infection. Previous studies have reported that the reluctance of HIV-infected individuals to seek dental care is associated with breach of confidentiality and fears of rejection.[16,17] Similarly, Wadsworth and McCann[18] found that the reluctance of HIV-infected individuals to seek care from a family physician was associated with fears about confidentiality and a lack of confidence in the ability of general practitioners to deal with HIV-related illnesses.

Two patients in this study did not seek dental care because they did not want to transmit HIV. The risk of HIV transmission in the dental office is remote,[6,19] and there are no documented cases of transmission from patient to patient. The risk of occupational transmission of HIV can be virtually eliminated if recommended infection control procedures, including universal precautions, are used, and percutaneous injuries are avoided. The risk of HIV transmission due to an HIV-contaminated needlestick injury is approximately 0.3 per cent.[20] There are no documented cases of HIV transmission to a dental health-care worker, although some cases are still under investigation in the United States.

Patients with HIV who are not medically compromised can be treated safely in the dental office, providing recommended infection control practices are used. In a previous study, we found that dentists who knew the risk of acquiring HIV infection after an HIV-contaminated needlestick injury (<1.0 per cent) were more likely to treat patients with HIV.[12]

Based on this study, it appears that patients need to know that they can attend a dental office where recommended infection control procedures are used, without fear of transmitting HIV to the dental team or other patients.

Fifteen per cent of respondents who had sought dental care since learning of their HIV infection had been refused treatment by at least one dentist. This is discussed elsewhere.[21] Rejection for treatment on the basis of HIV infection is considered unethical by the Canadian Dental Association.[4] Health-care workers, including dentists, who refuse to treat patients with HIV are vulnerable to charges of discrimination under the Charter of Human Rights and Freedoms as well as provincial legislation.

Many respondents had changed providers because of a dentist's refusal or reluctance to treat, or because of their fear of rejection. However, the major reason given for changing dentists was the relocation of the patient (**Table III**). Physicians caring for HIV-infected patients frequently refer patients to dentists who are known to be willing to treat HIV-seropositive patients, including hospital dental departments.

The Canadian Dental Association recommends that hospital facilities should be used for those patients who have medical complications requiring treatment in a special facility.[4] In this study, 40

Table V

Frequency Of HIV-Infected Patients Who Report Oral Problems (n = 97)

Category	Frequency	
	n	per cent
Mouth problems	62	64
Toothache	4	4
Other pain	2	2
Cavity(ies)	18	19
Denture problems	1	1
Loose teeth	5	5
Swelling	2	2
Bleeding gums	11	11
Thrush	33	34
Ulcers	4	4
Other mouth problem	13	13

Not all participants responded to this item.

per cent of respondents were receiving dental care in a hospital, and 60 per cent of these patients reported that they were well. There was no significant difference between the proportion of patients with AIDS or a CD4+ lymphocyte count of < 200 cells/mm^3 who reported receiving treatment in a hospital setting compared to those receiving treatment in a private dental office. The results of this study indicate that HIV-infected patients are not necessarily referred to hospital dental departments because they are medically compromised.

It is appropriate to provide routine dental care to patients with HIV in private dental offices. However, it is prudent for dentists to contact the responsible physician for information about the health status of patients with advanced HIV disease, including AIDS, and to seek advice regarding any additional precautions that are required before invasive procedures. These additional precautions are rarely necessary, but may include antibiotics or referral to the dental department of a hospital. Many patients with a low CD4+ lymphocyte count may not need special dental treatment if other hematological values are normal. Most patients with HIV are very well-educated about their disease, and know their most recent hematology results. Ninety-two per cent of respondents reported their current CD4+ lymphocyte (T4) count, and many were aware that they had HIV-related oral lesions including thrush (34 per cent) and hairy leukoplakia (three per cent). The management of the oral manifestations of HIV has been described previously.[22]

The attitude of respondents concerning dental care was generally positive. Only 12 per cent were dissatisfied with their dental care since HIV-diagnosis, and 19 per cent were uncomfortable about disclosing their HIV-seropositivity. Similarly, only 12 per cent of respondents were concerned that their HIV-status would not be kept confidential (**Table IV**).

Respondents who had visited a dentist in the previous year were more likely to disclose their HIV status, or to believe that they would get better dental care if their dentist knew that they were HIV positive ($p < 0.05$). Twenty-four respondents agreed that their dentist would be reluctant to treat them if they told him or her that they have HIV. However, the majority of these patients did disclose their HIV status to their current dentist, which indicates that many patients tell their dentists that they have HIV, even when they perceive that the dentist may be reluctant to treat them.

The reluctance of some dentists to treat patients with HIV may be based on economic factors. Previous studies found that dentists were concerned about the cost of improving infection control, and about losing patients from their practice if it became known that they are treating HIV-infected patients.[10-12,23,24] Little information is available concerning the relationship between the socioeconomic status of HIV-infected patients and the accessibility of dental care. In this study, respondents who reported having been refused dental treatment did not believe that this was due to economic factors. However, we found that a high percentage of respondents were unemployed, the majority of respondents reported an annual income less than $20,000, and one-third had an annual income of less than $10,000. The low income cut-off for individuals living in a Canadian community of similar size (population of 100,000 to 499,999) is $13,421.[25] Some respondents reported that they did not seek dental care because they could not afford treatment. Participants were significantly more likely to have received dental treatment within the previous year if they reported that they could afford it, or had dental insurance ($p < 0.01$). They were also more likely to have dental insurance if they had post-secondary education ($p < 0.001$). Statistics released by the Canadian Dental Association indicate that 70 per cent of Canadian adults have dental insurance, compared with 28 per cent of the HIV-infected patients who participated in this study. CDA also reported that 53 per cent of individuals with dental insurance visit a dentist every six months, compared with 33 per cent of those without dental

insurance.[26] In this study, 100 per cent of patients with full dental insurance coverage had attended a dentist's office in the last year, compared with 92 per cent of those with partial coverage, 86 per cent of those on social assistance, and 60 per cent of those without dental insurance ($p < 0.01$).

Previous reports show that there is a greater likelihood of losing full-time employment with the progression of HIV disease,[27] and that patients in lower socioeconomic groups are also more susceptible to the effects of HIV, possibly as a result of psychosocial or nutritional factors.[28] In other studies, HIV patients reported that they required dental care more than any other health service.[29] Also, low income groups with HIV[30] and without HIV[31] were all found to suffer a disproportionate share of untreated oral disease and a higher need for dental care. In this study, most respondents reported that they were in low-income groups and 61 per cent reported mouth problems.

The frequency of patients reporting mouth problems could be underestimated, because some respondents may be unaware that they have oral disease. The most commonly reported oral lesion was candidiasis (thrush), with a reported frequency similar to that noted in a cross-sectional study in which 34 per cent of all HIV-infected patients and 92 per cent of patients with AIDS had oral candidiasis.[31] Oral candidiasis and hairy leukoplakia are indicators of the stage of HIV-disease and Kaposi's sarcoma and lymphoma are diagnostic of AIDS.[32] HIV-infected persons frequently have oral disease associated with a deterioration in cell-mediated immunity, and suffer from an increased frequency of fungal and viral infections. They can also have more extensive and rapidly developing periodontal disease than the general population. Because of this increased burden of oral disease, it is important that HIV-infected patients have unrestricted access to oral care. Dentists can play a major role in the management of oral disease in HIV-infected patients, which can be painful and distressing for these individuals.

More research is required to investigate obstacles to the provision of dental care to persons with HIV, and the factors inhibiting HIV-infected patients from seeking care and disclosing their HIV-seropositivity. This was a preliminary descriptive study. Definitive studies using larger sample sizes are required to increase the power to detect statistically significant differences and randomization, which would improve generalizability. ■

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Utilisation des services dentaires et pourcentage de personnes possédant une assurance dentaire privée au Québec

Jean-Marc Brodeur, DDS, M.Sc., PhD
Mike Benigeri, DCD (France)
Marie Olivier, DMD, M.Sc.
Martin Payette, DDS

SOMMAIRE

Au Québec, l'utilisation des services dentaires et le pourcentage d'adultes qui adhèrent à un régime privé d'assurances dentaires sont en moyenne plus faibles que dans les autres provinces du Canada. Dans cette étude, réalisée par entrevues téléphoniques auprès d'un échantillon représentatif de la population québécoise âgée de 18 ans et plus (N = 8 042), 58 p. cent des personnes interrogées ont visité un dentiste (53 p. cent) ou un denturologiste (cinq p. cent) au cours des 12 mois précédant le sondage. Une analyse multivariée montre que les facteurs les plus fortement associés à l'utilisation des services dentaires sont par ordre décroissant d'importance le niveau d'édentation, le revenu et l'éducation.

Un peu plus du tiers des personnes de l'échantillon (36 p. cent) adhèrent à un régime d'assurance dentaire. On note que l'âge et le revenu sont les caractéristiques les plus fortement associées à la possession d'une assurance dentaire. Enfin, chez les personnes qui adhèrent à un régime d'assurance dentaire, 71 p. cent ont effectué une visite chez un dentiste ou un denturologiste au cours des 12 derniers mois versus 51 p. cent des personnes non assurées.

ABSTRACT

The utilization of dental health services and the percentage of adult members of a private health dental insurance plan are generally lower in Quebec than in the other Canadian provinces. In this study, results of a telephone survey of a representative sample of Quebec adults aged 18 and over (N = 8,042) show that 58 per cent of interviewed individuals visited a dentist (53 per cent) or a denturologist (five per cent) during the 12 months preceeding the interview. A multivariate analysis indicates that the most strongly associated factors related to the utilization of dental health services are, in decreasing order, edentulousness, income and level of education.

About one third (36 per cent) of those surveyed had dental insurance coverage. Age and income are the most strongly associated factors concerning the membership to a dental health insurance plan. Finally, among those with dental insurance coverage, 71 per cent had visited a dentist or a denturologist during the last 12 months compared to 51 per cent of those not insured.

Introduction

Depuis les années 60, on observe une augmentation de l'utilisation des services dentaires dans la plupart des pays d'Europe et d'Amérique du Nord. Cette augmentation est en grande partie due à une meilleure accessibilité économique et géographique des services et à l'augmentation des besoins ressentis par la population. Il faut cependant noter que cette augmentation n 'a pas été uniforme dans toutes les couches de la population et qu'elle n'a pas effacé les inégalités face à l'utilisation de ces services.[1]

Plusieurs études ont cherché à déterminer les facteurs associés à l'utilisation des services dentaires chez les adultes.[2-4] O'Keefe[5] a construit un modèle de régression qui explique l'évolution des dépenses pour les soins dentaires au Québec entre 1962 et 1991 à partir de trois variables: le rapport dentistes/population, le revenu par habitant et le pourcentage de personnes possédant une assurance dentaire. Le modèle de Millman[6]

sur l'accessibilité et l'utilisation des services de santé décrit trois types de barrières à cette accessibilité. Ce sont, premièrement, des barrières structurelles caractérisées par la disponibilité et l'organisation des services, deuxièmement, des barrières financières liées à la possession d'une assurance dentaire, au taux de remboursement des soins dentaires et au système public de soins (programmes publics, informations ...) et enfin, troisièmement, des barrières personnelles déterminées par la culture et les attitudes des personnes ainsi que par leur niveau d'éducation et de revenu.

Ainsi, le faible remboursement des soins dentaires par les différents régimes d'assurance maladie gouvernementaux fait que le coût des services est un des déterminants importants de cette utilisation. De ce fait, l'accessibilité financière aux services est reliée à la possession d'une assurance dentaire privée ou à un revenu élevé.[7,8] L'utilisation des services dentaires dépend aussi de l'offre de ces services, caractérisée par la répartition géographique des services et par le ratio dentistes/population. Les différences d'accessibilité géographique aux services dentaires expliquent en partie la variation dans leur utilisation suivant les régions. D'autre part, dans les régions où le ratio dentistes/population est plus élevé, il semble que la pratique des dentistes influence de façon positive l'utilisation des services.[9]

Certaines caractéristiques des personnes sont également associées à l'utilisation des services dentaires. Des études, aux États-Unis,[10,11] montrent que chez les adultes, ce sont les personnes âgées qui utilisent le moins les services dentaires. On retrouve chez ces personnes d'importantes barrières économiques mais aussi une faible demande de services associée à l'écart important qui existe entre les besoins ressentis et les besoins diagnostiqués de ces personnes.[12] De même, le niveau d'édentation, lui même relié à l'âge, est associé à la fréquence d'utilisation des services dentaires.[13]

Tableau I

Caractéristiques socio-démographiques des personnes de l'échantillon après pondération; (N = 8 042).

Variables	Catégories	p. cent
Âge	18-24 ans	12,3
	25-34 ans	23,9
	35-44 ans	21,5
	45-54 ans	15,4
	55-64 ans	12,3
	65 ans et +	14,6
Sexe	homme	48,5
	femme	51,5
Éducation	6 ans et -	7,5
	7 à 12 ans	45,2
	13-15 ans	24,0
	16 ans et +	23,3
Revenu	moins de 15 000 $	19,7
	15 000 à 24 999 $	16,3
	25 000 à 34 999 $	17,7
	35 000 à 54 999 $	22,4
	55 000 à 74 999 $	13,4
	75 000 $ et plus	10,5
Langue maternelle	français	81,0
	anglais	19,0

Enfin, les caractéristiques socio-économiques des personnes, mesurées à partir du niveau d'éducation et du revenu, sont également associées à l'utilisation des services dentaires.[14]

Au Québec, il existe peu d'information sur l'utilisation des services dentaires et le pourcentage de personnes possédant une assurance dentaire privée. Un des objectifs de la présente étude est de décrire l'utilisation des services dentaires et le niveau de couverture par une assurance dentaire ainsi que les facteurs qui leur sont associés chez les personnes âgées de 18 ans et plus dans toutes les régions du Québec.

Méthodologie

Il s'agit d'un sondage réalisé par la firme SOM-R, entre le 29 octobre et le 14 décembre 1993, auprès d'un échantillon représentatif des québécois âgés de 18 ans et plus et généré aléatoirement à partir de tous les échanges téléphoniques couvrant le territoire à l'étude. Cette procédure permet de prendre en compte les numéros confidentiels ou non publiés. L'échantillon a d'abord été sélectionné selon trois strates, avec 45 p. cent de l'échantillon provenant de la grande région de Montréal (indicatif 514), 30 p. cent provenant de la grande région de Québec (indicatif 418) et 25 p. cent d'ailleurs en province. Dans un deuxième temps, la sélection a consisté à choisir dans le ménage, de façon aléatoire, une personne âgée de 18 ans ou plus (procédure informatisée de sélection aléatoire simple sur l'âge).

Pour les analyses, les données ont été pondérées à trois niveaux: premièrement par rapport au nombre moyen de personnes de 18 ans

Tableau II

Visite chez un dentiste ou un denturologiste au cours des 12 derniers mois en fonction des variables socio-démographiques.

Variables	Catégories	Analyse univariée		Analyse multivariée	
		p. cent	p (X^2)	R.C. ajustés	I.C. 95 p. cent
Ensemble de l'échantillon		58			
ÂGE			< 0,001		
	18-24 ans	67		0,82	0,66 - 1,01
	25-34 ans	69		0,89	0,75 - 1,05
	35-44 ans	67		1,00	Référence
	45-54 ans	57		0,80	0,66 - 0,96
	55-64 ans	47		0,67	0,54 - 0,83
	65 ans et +	32		0,68	0,54 - 0,86
SEXE			0,006		
	femme	60		1,57	1,40 - 1,77
	homme	56		1,00	Référence
ÉDUCATION			< 0,001		
	6 ans et -	25		0,44	0,33 - 0,59
	7 à 12 ans	51		0,77	0,66 - 0,90
	13-15 ans	67		0,84	0,71 - 1,00
	16 ans et +	76		1,00	Référence
REVENU			< 0,001		
	moins de 15 M	42		0,32	0,25 - 0,41
	15-24 M	48		0,37	0,29 - 0,48
	25-34 M	55		0,38	0,30 - 0,49
	35-54 M	67		0,57	0,44 - 0,72
	55-74 M	72		0,64	0,50 - 0,84
	75 M et plus	84		1,00	Référence
LANGUE MATERNELLE			< 0,001		
	français	57		0,76	0,65 - 0,89
	anglais	68		1,00	Référence
NIVEAU D'ÉDENTATION			< 0,001		
	Édenté haut et bas	17		0,13	0,11 - 0,16
	Édenté haut ou bas	56		0,55	0,46 - 0,65
	Denté haut et bas	72		1,00	Référence

ou plus par logement, deuxièmement par expansion à la distribution d'âge et de sexe de la population de chacune des strates au dernier recensement canadien et troisièmement selon les distributions en fonction de la langue maternelle de chacune des strates au même recensement.

Les questionnaires ont été administrés par téléphone avec assistance informatique. Jusqu'à cinq appels ont été faits pour tenter de rejoindre chacun des ménages. Le nombre total de participants est de 8 042, ce qui représente un taux de participation de 63,2 p. cent pour l'ensemble de la province.

Le questionnaire formulé en français et en anglais comportait

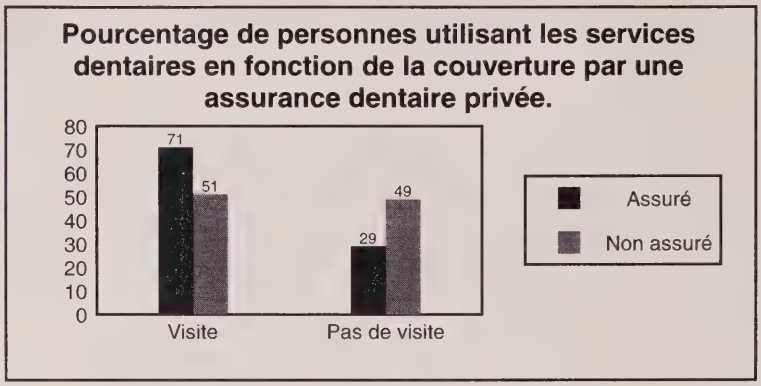

Fig. 1: $X^2_{(d1=1)} = 294$ $p<0,001$

10 questions portant sur l'utilisation des services dentaires, les assurances dentaires, l'édentation, le port de prothèses, l'hygiène dentaire, la satisfaction relative aux fonctions bucco-dentaires et la capacité de mastiquer certains aliments.

Résultats

Caractéristiques descriptives de l'échantillon

Le **Tableau I** montre la distribution des sujets de l'échantillon selon les différentes strates des variables socio-démographiques retenues pour l'étude. Les données étant pondérées, il s'agit d'un portrait représentatif de la population québécoise âgée de 18 ans et plus lors du dernier recensement canadien.

Utilisation des services dentaires

Le **Tableau II** et la **Fig. 1** indiquent les pourcentages de personnes ayant visité un dentiste ou un denturologiste au cours des 12 derniers mois en fonction de leurs caractéristiques socio-démographiques. Globalement, 58 p. cent des personnes de l'échantillon ont visité soit un dentiste (53 p. cent) soit un denturologiste (cinq p. cent) au cours des 12 mois précédant le sondage. Ce chiffre est légèrement supérieur à ceux des sondages SOM-R de 1991 et 1992 avec respectivement 52 p. cent et 47 p. cent des adultes québécois qui avaient consulté un dentiste dans les 12 derniers mois.[15] Aux États-Unis, un sondage téléphonique effectué en 1986 a montré que 63 p. cent des américains avaient visité un dentiste dans les 12 derniers mois.[3] En Ontario, 78 p. cent des adultes consultent annuellement un dentiste.[16] Dans la présente étude, toutes les variables socio-démographiques répertoriées au **Tableau II**, ainsi que le niveau d'édentation sont fortement associées à l'utilisation des services dentaires.

Chez les personnes âgées de 65 ans et plus, 32 p. cent des individus ont effectué une visite chez un dentiste ou un denturologiste durant les 12 derniers mois. C'est moitié moins que chez les personnes âgées de 18 à 44 ans. Mais il faut noter que l'utilisation des services dentaires est largement reliée au niveau d'édentation, lui même relié à l'âge. Ainsi seulement 17 p. cent des personnes complètement édentées ont visité un dentiste dans les 12 derniers mois contre 72 p. cent pour les personnes ayant des dents sur les deux maxillaires.

Concernant le niveau d'éducation, le pourcentage de personnes ayant visité un dentiste dans les 12 derniers mois varie de 25 p. cent pour les personnes avec une scolarité de six ans ou moins jusqu'à 76 p. cent pour les personnes ayant complété 16 années ou plus de scolarité. On retrouve le même phénomène avec le revenu familial; en effet, 42 p. cent des personnes avec un revenu inférieur à 15 000 $ ont fait une visite chez un dentiste ou un denturologiste dans les 12 derniers mois versus 84 p. cent des personnes avec un revenu de 75 000 $ ou plus.

D'autre part, on peut noter que les femmes utilisent un peu plus les services dentaires que les hommes (60 p. cent contre 56 p. cent) de même que les anglophones par rapport aux francophones (68 p. cent contre 57 p. cent).

Le **Tableau II** indique également les rapports de cote ajustés pour les différentes variables socio-démographiques par une analyse multivariée. Les facteurs les plus fortement associés à l'utilisation des services dentaires sont par ordre décroissant d'importance: le niveau d'édentation, le revenu et l'éducation. De plus, si l'analyse univariée de l'utilisation des services dentaires montre très peu de différences entre les hommes et les femmes, l'analyse multivariée, indique que les femmes ont 1,57 fois plus de probabilité que les hommes d'avoir fait une visite chez un dentiste ou un denturologiste dans les 12 derniers mois. Enfin, la **Fig. 1** démontre très clairement que la couverture par une assurance dentaire est associée à l'utilisation des services. En effet, 71 p. cent des personnes assurées ont effectué une visite dentaire dans les 12 derniers mois versus 51 p. cent des personnes non assurées ($p < 0,001$).

Assurances Dentaires Privées

Le **Tableau III** indique les pourcentages de personnes possédant une assurance dentaire privée en fonction de leurs caractéristiques socio-démographiques. Globalement 36 p. cent des personnes de l'échantillon possèdent une assurance dentaire privée. Ce pourcentage est inférieur à la moyenne canadienne (51 p. cent) et pratiquement deux fois plus faible que le pourcentage de personnes possédant une assurance dentaire privée en Ontario (66 p. cent).[17]

Le fait de posséder une assurance dentaire privée est indépendant du sexe et de la langue d'origine. Par contre l'âge est associé à la possession d'une assurance dentaire privée. Chez les personnes de 18 à 54 ans, 39 à 46 p. cent des individus sont assurés. Par contre, chez les personnes de 55 à 64 ans et chez celles de 65 ans et plus, on trouve respective-

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Tableau III

Couverture par une assurance dentaire privée en fonction des variables socio-démographiques

Variables	Catégories	Analyse univariée		Analyse multivariée	
		p. cent	p (X^2)	R.C. ajustés	I.C. 95 p. cent
Ensemble de l'échantillon		36			
ÂGE			< 0,001		
	18-24 ans	39		1,22	1,00 - 1,49
	25-34 ans	44		1,09	0,94 - 1,27
	35-44 ans	46		1,00	Référence
	45-54 ans	43		0,90	0,76 - 1,07
	55-64 ans	25		0,53	0,43 - 0,66
	65 ans et +	7		0,18	0,13 - 0,25
SEXE			0,016		
	femme	35		1,06	0,95 - 1,18
	homme	37		1,00	Référence
ÉDUCATION			< 0,001		
	6 ans et -	9		0,72	0,50 - 1,04
	7 à 12 ans	33		1,35	1,16 - 1,57
	13-15 ans	45		1,41	1,21 - 1,65
	16 ans et +	42		1,00	Référence
REVENU			< 0,001		
	moins de 15 M	16		0,18	0,14 - 0,23
	15-24 M	21		0,21	0,17 - 0,26
	25-34 M	32		0,32	0,26 - 0,40
	35-54 M	51		0,71	0,59 - 0,87
	55-74 M	57		0,93	0,75 - 1,14
	75 M et plus	59		1,00	Référence
LANGUE MATERNELLE			0,474		
	français	36		0,93	0,81 - 1,08
	anglais	37		1,00	Référence
NIVEAU D'ÉDENTATION			< 0,001		
	Édenté haut et bas	21		1,04	0,87 - 1,23
	Édenté haut ou bas	32		0,90	0,75 - 1,08
	Denté haut et bas	41		1,00	Référence

ment 25 p. cent et sept p. cent d'individus possédant une assurance dentaire privée.

Le revenu familial est fortement associé à la possession d'une assurance dentaire privée. En effet, la proportion de personnes assurées croit régulièrement de 16 p. cent, chez les personnes du plus faible revenu à 59 p. cent chez celles jouissant des revenus les plus élevés. Le niveau d'éducation est également associé de façon positive à la possession d'une assurance dentaire privée avec des proportions d'assurés croissant de neuf p. cent à 45 p. cent.

Sur la base de l'analyse univariée, les personnes complètement édentées apparaissent deux fois moins assurées que les personnes qui possèdent des dents sur les deux maxillaires. Toutefois, lorsque cette association est vérifiée dans un modèle multivarié contrôlant pour l'âge et le revenu, ceux-

ci étant les deux facteurs les plus associés à la possession d'une assurance dentaire privée, elle apparaît non significative.

Le **Tableau IV** présente les proportions d'utilisateurs des services dentaires et d'assurés pour chacune des régions socio-sanitaires du Québec. Plusieurs régions affichent un profil semblable de sorte qu'il est possible de les regrouper en trois catégories. Les régions où l'utilisation des services et la couverture par une assurance dentaire privée sont faibles; ce sont les régions rurales ou à forte composante rurale (Bas Saint-Laurent, Gaspésie / Îles de la Madeleine, Abitibi-Témiscamingue, Saguenay/Lac-St-Jean, Côte-Nord, Nord du Québec, Mauricie/Bois-Francs, Chaudière-Appalaches). Les régions où l'on observe les taux les plus élevés d'utilisation des services dentaires et de couverture par une assurance dentaire privée, ce sont les régions urbaines où l'on retrouve les pourcentages les plus élevés d'anglophones (Ouest de Montréal, Estrie, Outaouais, Laval, Laurentides, Montérégie). Enfin, entre ces deux catégories de régions, se trouve une catégorie intermédiaire représentée par les régions de Québec, Lanaudière et de l'Est de l'Île de Montréal.

Tableau IV

Utilisation des services dentaires* et pourcentage de personnes possédant une assurance dentaire privée en fonction des régions du Québec

Régions du Québec	Visite (p. cent)	Assurance (p. cent)
Ouest de l'Île de Montréal	68	39
Estrie et Outaouais	62	35
Laval	62	43
Laurentides	61	44
Montérégie	61	45
Québec	58	33
Lanaudière	56	47
Est de l'Île de Montréal	58	35
Chaudière-Appalaches	51	29
Région A**	50	27
Mauricie / Bois-Francs	50	26

**Pourcentage des personnes ayant visité un dentiste ou un denturologiste au cours des 12 derniers mois.*

***Région A : Saguenay/Lac-St-Jean, Abitibi-Témiscamingue, Côte-Nord, Nord du Québec, Gaspésie/ Îles de la Madeleine et Bas Saint-Laurent*

Discussion

Plusieurs phénomènes sont à prendre en compte pour comprendre l'utilisation des services dentaires au Québec. Tout d'abord, le niveau de couverture des québécois par une assurance dentaire privée est très inférieur à celui des Ontariens. Ce faible niveau d'adhésion à un régime d'assurance dentaire privée explique en partie les différences dans l'utilisation des services dentaires entre le Québec et l'Ontario et aussi, l'inégalité qui existe dans les différentes couches de la population face à l'utilisation des services dentaires.

En effet, l'utilisation des services dentaires est fortement reliée à la possession d'une assurance privée. On constate ainsi que ce sont les mêmes groupes de la population qui sont désavantagés par rapport à ces deux phénomènes, à savoir, les personnes à très faible revenu, celles avec un faible niveau d'éducation, les personnes complètement édentées et les personnes âgées. Mais ces facteurs n'agissent pas de la même façon sur l'utilisation et sur l'assurance. L'utilisation des services dentaires est principalement reliée au niveau d'édentation et au niveau d'éducation alors que par rapport à l'assurance dentaire privée, l'âge et le revenu ont un rôle prépondérant. Ceci s'explique par le fait qu'une partie des personnes assurées le sont par l'intermédiaire de leur employeur, excluant ainsi les personnes âgées ou sans travail.

Il faut noter qu'au Québec, les personnes avec un faible revenu (bénéficiaires de la sécurité du revenu) ont accès à une assurance dentaire gouvernementale et que malgré cela, leur utilisation des services dentaires reste faible.

Ainsi, la réduction des inégalités concernant l'utilisation des services dentaires, ne passe pas seulement par l'amélioration de leur accessibilité économique en augmentant le taux de couverture par une assurance privée ou publique, mais aussi par l'amélioration des connaissances et la modification des attitudes dans les groupes désavantagés afin d'augmenter leur demande de services et l'utilisation de leur assurance dentaire publique.

Enfin, l'accessibilité géographique est aussi un obstacle à l'utilisation des services dentaires dans plusieurs des régions du Québec. Ainsi, lorsque l'on regarde la répartition des dentistes dans la province, on dénombre près de huit dentistes pour 10 000 personnes à Montréal contre seulement deux dentistes pour 10 000 personnes dans la région du Bas St-Laurent/Gaspésie.[17] Il est intéressant de noter que toutes les régions précitées, où l'utilisation des services et la couverture par une assurance dentaire privée sont faibles, ont un ratio dentistes / population inférieur à trois pour 10 000.

Conclusion

Entre 1971 et 1985, le pourcentage de personnes qui ont effectué une visite chez un dentiste au cours des 12 derniers mois est passé de 29 à 51 p. cent.[18] En 1988 ce pourcentage était de 47 p. cent[19] et il est aujourd'hui de 53 p. cent. Ainsi, après plusieurs années de croissance, l'utilisation des services dentaires semble avoir atteint un plateau au Québec.

La situation actuelle est telle que l'utilisation des services dentaires est plus élevée en Ontario qu'au Québec alors que c'est l'inverse pour la prévalence des maladies bucco-dentaires. Le niveau de santé bucco-dentaire des adultes québécois ne saurait atteindre celui des autres provinces du Canada, et en particulier de l'Ontario, sans que des efforts ne soient déployés pour améliorer le niveau d'utilisation des services dentaires préventifs et curatifs chez certains groupes cibles.

On peut noter ici l'exemple de l'Alberta où, grâce à un plan dentaire universel pour les personnes âgées de plus de 64 ans, le pourcentage des personnes âgées qui visitent un dentiste est passé de 27 à 44 p. cent entre 1974 et 1991.[20] Pour augmenter l'utilisation des services dentaires au Québec il faudra également faciliter l'accès aux assurances dentaires privée et publiques aux personnes à faible niveau socio-économique et chercher à modifier leurs attitudes vis-à-vis de la santé dentaire. Ceci afin que ces personnes, qui utilisent actuellement les services dentaires pour des soins d'urgence, en viennent à les utiliser de plus en plus pour recevoir des soins préventifs. ■

Remerciements: Cette étude a été rendu possible grâce aux subventions obtenues du Fonds de la recherche en santé du Québec, de la Direction générale de la santé publique du Ministère de la santé et des services sociaux du Québec ainsi que de l'Ordre des dentistes du Québec. Nous remercions également la firme SOM-R qui a administré les questionnaires ainsi que le département de médecine préventive de l'Hôpital St-Luc et la Direction de la santé publique de la Régie régionale de Montréal-Centre pour leur support dans la réalisation de cette étude.

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DID YOU KNOW?

Taking Stock

A September 1953 *Journal of the CDA* editorial by Sir William Osler, probably Canada's most eminent teacher-physician, reminds us more than 40 years later of the importance of dental society meetings:

"We doctors do not take stock often enough and are apt to carry on our shelves out of date goods. Society meetings help to keep a man up to the times and enables him to refurbish his shop with the latest wares. It keeps his mind open and receptive and counteracts the tendency to premature senility which is apt to overtake the man who lives in a routine."

BOOK REVIEWS

Oral Manifestations of HIV Infection

John S. Greenspan and Deborah Greenspan. Editors.

Quintessence Publishing Co. Inc, Chicago,1995.
381 pages, Approx. $68 U.S.

The 50 papers compiled in this text were first presented at a conference on the oral manifestations of HIV infection in San Francisco in February 1993.

The first group of papers report on the epidemiology of lesions in HIV-infected patients. Most report that about 40 per cent of patients in the advanced stages of infection, i.e. when T4 lymphocyte counts are below 400, have one or more oral lesions. The second group of papers describes the various forms of candidiasis seen in these patients. Next, the anti-viral action of saliva and mucosal immunity are discussed.

The Sjogren's-like salivary gland disease affecting the parotids particularly and seen in HIV-infected children is described in two papers. The pathogenesis remains obscure, and children with this condition apparently develop AIDS later, although it is also reported that they have a higher incidence of lymphoma.

Several papers analyze Epstein-Barr virus and hairy leukoplakia in which this virus is present. The many possible causes of oral ulceration are discussed by Dr. Ficarra, who lists herpes simplex, cytomegolvirus, varicella-zoster and Epstein-Barr as possible viral causes and adds six bacteria and three fungi. The question of whether the apthous-like ulcers are essentially the same lesions as occur in the immunocompetent remains undecided.

There are three papers on the special aspects of HIV infection in children. Six papers review the association of periodontal disease with HIV infection and conclude that it is much less prevalent than was reported earlier for acute necrotising ulceration gingivitis being 10 per cent or less and for HIV-associated periodontitis five per cent or less. Zambon and co-workers report that the same bacteria involved are in HIV-associated chronic periodontitis and in non-HIV infected patients.

Occupational risk of HIV infection is reported as small, with transmission of virus occurring in 0.25 per cent of accidental contaminated sharp instrument injuries. By 1992, there were 69 possible cases of occupational exposure to HIV known to the U.S. Centers for Disease Control and Prevention, of which six were dental care providers. Seven papers discuss the methods and attitudes involved in the provision of dental care for the HIV-positive population. Several papers describe dedicated dental clinics in the United States and discuss why patients choose such facilities for their care. Arguments for and against the establishment of such clinics are propounded by a supporter of the concept and an opponent. Finally, current therapy for oral diseases associated with HIV infection is presented in tabular form.

This book will be of interest to all dentists who want to remain current on HIV-associated diseases of the mouth.

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La Perts Des Dents

par Dr Paul Mercier

Méridien
Montréal, Québec, 1995.
123 pages, environ $ 24.

Le docteur Paul Mercier, chirurgien buccal et maxillo-facial fondateur de la clinique d'atrophie des maxillaires, a depuis 1978 accompli un immense travail de recherche pour les édentés et les porteurs de prothèse dentaire au Québec.

Tout récemment le docteur Mercier, dans son livre "La perte des dents véritables enjeux" publié chez Méridien, nous fait part de ses travaux de recherche qui sont axés sur les concepts des dents, la mastication reliée à la nutrition et à la digestion.

Ce livre se veut être le résult at d'une vie professionnelle et il décrit de façon précise et statistique les problèmes que les édentés rencontrent à travers les diverses étapes de leur vie. Mais aussi on y rencontre des solutions pour ces patients(es) et le docteur Mercier, avec son expérience clinique, décrit les diverses possibilités qui sont offertes.

L'importance d'une recherche sérieuse a apporté au docteur Mercier un concept épidémiologique des plus intéressant et l'évaluation régulière des patients(es) permet un suivi des plus adéquat et à vrai dire une diminution des conséquences néfastes sur le bien-être et la santé des individus.

Finalement tout dentiste s'intéressant à la santé et au bien-être de son patient aura une bibliographie compète qui aidera sûrement à une future consultation et ouvrira des horizons inespérés.

Reviewed by:
Guy Maranda, DDS, FRCD (C)
Université Laval
Ste-Foy, Québec

Lasers in Dentistry

Leo J. Miserendino and Robert M. Pick, Editors

Quintessence Publishing Co., Inc., Chicago, 1995.
344 pages, 349 illustrations (160 in color), $98 (U.S.)

To quote the editors, "*Lasers in Dentistry* is not just another dental textbook about specialized aspects of dentistry." It is the first book on lasers to pertain solely to the field of dentistry. As such, it serves not only as a valuable source of clinical and scientific information, but also as a source of reference for the dental student, dentist or researcher who uses lasers. This textbook is, however, aimed mainly at the clinical dentist, to help him or her understand the differences between the number of lasers available, with a view to using them in clinical practice.

The text is organized into four parts. Part I, The Scientific Basis of Laser Dentistry, reviews the history and development of lasers, laser physics, basic tissue interactions, and dental tissue interactions. Part II, Practical Considerations for Lasers in Dentistry, focuses on laser safety, regulations, standards and education of laser users. Part III, Current Applications, is an extensive literature review of laser use in clinical practice and in the research laboratory today. Part IV, Current Technology and Future Directions, explores the new class of excimer lasers, and new concepts in laser-tissue interactions when air and water spray are added to the laser beam. The appendices include not only a glossary of terms and their definitions, but also a document outlining recommended curriculum guidelines and standards for dental laser education that was developed at the University of California in 1992.

In general, the information in this book is well organized. It is also well illustrated with clear and concise drawings, tables or graphs. The clinical photographs are well done, although many of the photomicrographs of histologic specimens were at too low a power to discern much detail. Sections particularly well done were: laser physics and tissue interactions, and clinical applications. However, the critical contribution that the CO_2 laser has made to the development of the knowledge base on lasers was omitted from the history and development of lasers. In addition, many of the references quoted in the sections on laser effects on dental tissues were *in-vitro* experiments and hence are biased. The reader should keep these things in mind when reading these sections.

This book provides a concise compilation of information on lasers and their use in clinical dentistry. It is well written and illustrated, and should serve clinicians well. It removes the mystery surrounding this new resource and will even serve well as a reference book for those more seasoned laser users.

Reviewed by:
Patricia L. Ling, B.Sc., DDS, M.Sc.
University of Manitoba
Winnipeg, Manitoba

LISTERINE*

ANTISEPTIC-ANTIPLAQUE
ANTIGINGIVITIS - MOUTHWASH

INDICATIONS: Helps reduce gingivitis (minor inflammation of the gums caused by plaque above the gumline) when used in a conscientiously applied program of oral hygiene and dental care. Kills the germs that cause bad breath, plaque, gingivitis and sore throats due to colds.

CAUTIONS: Keep out of reach of children. Do not swallow. Not to be used by children under 12 years of age. In case of accidental ingestion, contact a Poison Control Centre or doctor immediately.

DOSAGE: Rinse full strength with 20 mL for 30 seconds twice a day.

MEDICINAL INGREDIENTS: Eucalyptol 0.091% w/v, Thymol 0.063% w/v, Menthol 0.042% w/v.

NON-MEDICINAL INGREDIENT: Alcohol.

NOTE: Cold temperatures may cloud this product, its efficacy will not be affected.

SUPPLIED:

Original Listerine: Clear, amber liquid available in bottles of 250, 500, 750, and 1,000 mL.

Cool Mint Listerine: Clear, blue, cool mint flavoured liquid available in bottles of 250, 500, 750, and 1,000 mL.

Fresh Burst Listerine: Clear, green, mint flavoured liquid available in bottles of 250, 500, 750, and 1,000 mL.

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INTERNATIONAL

February 3-10

36th International Alpine Dental Conference in Courchevel, France. Lecturers: Dr. Lou Rossman, Prof. Ivar Mjör and Fr. Martin Ritzau. Contact the International Dental Foundation, 53 Sloane St., London SW1X 9SW, U.K. Tel.: 00 44 (0) 171 235-0788, or fax: 00 44 (0) 171 235-0767.

March 23-30

37th International Alpine Dental Conference in Courchevel, France. Lecturers: Dr. Oded Bahat and Prof. Birte Melson. Contact the International Dental Foundation, 53 Sloane St., London SW1X 9SW, U.K. Tel.: 00 44 (0) 171 235-0788, or fax: 00 44 (0) 171 235-0767.

May 5-8

5th Congresss Of The International Society for Lasers In Dentistry in Jerusalem, Israel. Contact ISLD, P.O. Box 50006, Tel Aviv, 61500, ISRAEL. Tel.: 972 3 5140000, or fax: 972 3 5174674 or 972 3 5140077.

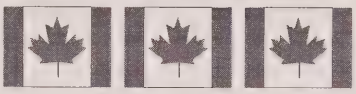
June 18-22

Turkish Dental Association's 3rd International Dental Congress in Ankara, Turkey. Tel: 0 312 479 8924, or fax: 0 312 474 79 25.

July 11-13

International Women's Dental Conference in Melbourne, Australia. "Enhancing the balance both personally and professionaly." Contact Amanda Lawrence, 3 Railway Walk, Hampton 31188, Australia. Tel.: (03) 9521 6500, or fax: (03) 9521 6501.

CANADA



February 10

Integrating Implants Into Your General Practice. Co-sponsored by Dalhousie University and Dentsply Canada. Presenter: Harvey J. Branicky. Contact Continuing Education, Faculty of Dentistry, Dalhousie University. Halifax, N.S. B3H 3J5. Tel.: (902) 494-1674, or fax: (902) 494-2527.

February 16-17

Basic Endodontics: Update On Instruments and Techniques. Contact Darcy Duggan, University of Manitoba. Tel.: (204) 789-7331, or fax: (204) 888-4113.

February 23

The George Hare Endo Study Club. Dr. Donald E. Arens on "Advanced Endodontic Techniques for Successful Endo Treatment." Contact Dr. Chris Tasios, University of Toronto. Tel.: (416) 751-8400.

February 23

Academy of General Dentistry, Ontario Division, presents Dr. Eric Shapira, "My Dogs Don't Bite, But My Patients Do!" — Howard Johnson Plaza Hotel, Toronto. Contact Wendy Maginn at (416) 323-0101.

February 23-24

Preventive Dentistry Forum — Home Care Products and Office Procedures for the Preventive-Oriented Dental Practice. Contact Continuing Dental Education, Faculty of Dentistry, University of Toronto. Tel.: (416) 979-4902, ext. 4503 or 4590, or fax: (416) 979-4941.

February 24

Head And Neck Cancer: A Team Approach To Management. Contact Darcy Duggan, University of Manitoba. Tel.: (204) 789-7331, or fax: (204) 888-4113.

March 2

X-ray X-cellence. Presenters: Dr. Barry Pass and Dr. Tom Blackmore. Contact Continuing Education, Faculty of Dentistry, Dalhousie University. Halifax, N.S. B3H 3J5. Tel.: (902) 494-1674, or fax: (902) 494-2527.

March 2 — Part I
September 28 — Part II
March 1, 1997 — Part III

Mini-Residency in Periodontics. Presented by the Manitoba Society of Periodontists. Contact Darcy Duggan, University of Manitoba. Tel.: (204) 789-7331, or fax: (204) 888-4113.

March 2-4

5th Annual Whistler Resort Dental Seminar. Hosted by the Vancouver Chapter of Alpha Omega Fraternity. Contact Beverly Corber, 6738 Montgomery St., Vancouver, B.C. V6P 4G4. Tel.: (604) 266-2454, or fax: (604) 266-7335.

March 11-15

British Columbia Academy of General Dentistry's Ski & Continuing Education Conference in Whistler, B.C. Contact the AGD, B.C. Chapter 206, 5722-176A St. Surrey, B.C. V3S 6H5. Tel.: 1-800-933-1339.

March 13-15

1996 Western Canada Dental Bonspiel in Calgary. Contact Dr. Joey H. Brown, 211, 1632-14th Ave. N.W., Calgary, Alta. T2N 1M7. Tel: (403) 289-7370, or fax: (403) 289-6830.

March 23

Oral Pathology: Selected Controversies. Presenter: Dr. Thomas Daily. Contact Continuing Education, Faculty of Dentistry, Dalhousie University. Halifax, N.S. B3H 3J5. Tel.: (902) 494-1674, or fax: (902) 494-2527.

March 29-30

Southern Ontario Surgical Orthodontic Study Group will meet in Windsor, Ont. Contact Dr. Jeff Berger. Tel.: (519) 258-2632, or fax: (519) 258-2637.

April 16

Review of Analgesics in Dentistry. Presenter: Dr. W.C. Foong. Contact Continuing Education, Faculty of Dentistry, Dalhousie University. Halifax, N.S. B3H 3J5. Tel.: (902) 494-1674, or fax: (902) 494-2527.

April 18

Emergency Procedures In The Dental Practice — Dr. Earl Young. Contact Continuing Dental Education, Faculty of Dentistry, University of Toronto. Tel.: (416) 979-4902, ext. 4503 or 4590, or fax: (416) 979-4941.

April 22

The George C. Hare Lecture in Endodontics. Guest speaker: Dr. Gunnar Bergenholtz, Goteborg, Sweden. Registration will be limited to the first 120 persons. Contact Continuing Dental Education, Faculty of Dentistry, University of Toronto. Tel.: (416) 979-4902, ext.: 4503 or 4590, or fax: (416) 979-4941.

April 27

Review and Update in Medicine. Contact Continuing Education, Faculty of Dentistry, Dalhousie University. Halifax, N.S. B3H 3J5. Tel.: (902) 494-1674, or fax: (902) 494-2527.

April 27

Innovations In Clinical Dentistry: New Directions For the 21st Century — Howard Strassler, DMD. Contact Darcy Duggan, University of Manitoba. Tel.: (204) 789-7331, or fax: (204) 888-4113.

May 4

An Overview of Forensic Dentistry. Presenter: Dr. David Sweet. Contact Continuing Education, Faculty of Dentistry, Dalhousie University. Halifax, N.S. B3H 3J5. Tel.: (902) 494-1674, or fax: (902) 494-2527.

May 10-11

Joint meeting of the **Canadian Academy of Periodontology (CAP)** and the **Association of Prosthodontists of Canada (APC)** in Montreal, Que. Contact Dr. Don Kramer (APC), tel.: (416) 597-0839; or Dr. Lorne Wiseman (CAP), tel.: (514) 937-3535.

May 11

Pediatric Dentistry, 1996: A Renaissance. Presenter: Dr. Theodore Croll. Contact Continuing Education, Faculty of Dentistry, Dalhousie University. Halifax, N.S. B3H 3J5. Tel.: (902) 494-1674, or fax: (902) 494-2527.

June 7-9

Canadian Dental Hygienists' Association 7th Annual Professional Conference — "Interdependence and Independence: Striking a Balance." Contact Janice Edgar. Tel.: (613) 221-5515, or fax: (613) 224-7283.

July 23-26

8th International Congress of the International Association of Oral Pathologists in Toronto. Contact Congress Office, P.O. Box 1570, 190 Railway St., Kingston, Ont. K6L 5C8.

August 17-22

8th World Congress on Pain in Vancouver, B.C. Sponsored by the International Association for the Study for Pain (IASP). Contact the IASP Secretariat, 909 N.E. 43rd St., Suite 306, Seattle, Wash. 98105, U.S.A. Tel.: (206) 547-6409, or fax: (206) 547-1703.

November 1-2

Southern Ontario Surgical Orthodontic Study Group will meet in Windsor, Ont. Contact Dr. Jeff Berger. Tel: (519) 258-2632, or fax: (519) 258-2637.

U.S.A.

February 29-March 2

Eleventh Annual Meeting of the Academy of Osseointegration in New York, N.Y. Contact Daniel Consiglio, 401 North Michigan Ave., Chicago, Ill. 60611-4267. Tel.: (312) 321-5169, or Internet: daniel_consiglio@osseo.org.

March 2-3

The 1996 Moyers Symposium — Creating the Compliant Patient — in Ann Arbor, Michigan. Sponsored by the School of Dentistry and The Center for Human Growth and Development. Contact the Office of Continuing Education, School of Dentistry, The University of Michigan. Ann Arbor, Mich. 48109-1078. Tel.: (313) 763-5070, or fax: (313) 936-3065.

April 14-16

Minnesota Dental Association's 113th Star of the North Meeting. Contact the Minnesota Dental Association, 2236 Marshall Ave., St. Paul, Minn. 55104. Tel.: (612) 646-7454, or fax: (612) 646-8246.

June 13-16

1996 Annual Symposium of the Office Sterilization and Asepsis Procedures (OSAO) Research Foundation in Dallas, Texas. OSAP Central Office, P.O. Box 6297, Annapolis, Md. 21401. Tel.: (410) 798-5665 or 1-800-298-6727, or fax: (204) 798-6797.

September 25-27

Call for abstracts for the **59th Annual Meeting of the American Association of Public Health Dentistry** in Orlando, Florida. Dead-

line for abstract submission is May 1, 1996. Contact the AAPHD National Office, 10619 Jousting Lane. Richmond, Va. 23235-8344. Tel.: (804) 272-8344, or fax: (804) 272-0802.

DENTAL MEETINGS

January 18-20

Annual Meeting of the Manitoba Dental Association in Winnipeg. Contact Ross McIntyre. Tel.: (204) 453-0055.

March 14-16

British Columbia Dental Meeting in Vancouver. Contact Marilynne Webster. Tel.: (604) 736-3645.

March 29-30

Interim Meeting of the CDA Board of Governors in Ottawa. Contact Suzanne Burton. Tel.: (613) 523-1770, ext. 201, or 1-800-267-6354.

May 2-4

Ontario Dental Association Annual Spring Meeting in Toronto. Tel.: (416) 922-3900.

May 9-11

Newfoundland Dental Association Annual Meeting in Cornerbrook. Tel.: (709) 579-2362.

May 23-25

Prince Edward Island Dental Association Annual Meeting in Mill River. Contact Dr. Cheryl Wenn. Tel.: (902) 628-8088.

May 25-29

25e Congrès annuel de l'Ordre des dentistes du Québec — Les Journées dentaires in Montreal, Que. Contact Nicole Pagé or Ginette Boutin. Tel.: (514) 875-8511 or fax: (514) 875-1561.

May 31-June 1

New Brunswick Dental Society Annual Meeting in St. Andrews. Tel.: (506) 452-8578.

June 6-9

Alberta Dental Association Annual Meeting and Convention in Kananaskis. Tel.: (403) 432-1012.

June 13-16

1996 Annual Symposium of the Office Sterilization and Asepsis Procedures (OSAO) Research Foundation in Dallas, Texas. Contact the OSAP Central Office, P.O. Box 6297, Annapolis, Md. 21401. Tel.: (410) 798-5665, or 1-800-298-OSAP(6727), or fax: (410) 798-6797.

June 14, 15

Nova Scotia Dental Association Annual Meeting in Baddeck. Contact Steve Jennex. Tel.: (902) 420-0088.

August 17-20

Annual Meeting of the CDA Board of Governors in Montreal. Contact Suzanne Burton. Tel.: (613) 523-1770, ext. 201, or 1-800-267-6354.

Notices of meetings and continuing education courses are published without charge for appropriate **not-for-profit** dental organizations, teaching facilities or recognized study clubs. Information must be received two months prior to expected publication date, and will be published at the discretion of the editor. Send all requests c/o Ms. Rachel Galipeau, *Journal* editorial assistant, Canadian Dental Association, 1815 Alta Vista Dr., Ottawa, Ont. K1G 3Y6.

8th Annual National Conference on Special Care Issues in Dentistry

April 19 - 20, 1996

Stouffer Renaissance Hotel, Chicago

A conference of more than 300 researchers, clinicians, institutional dental directors, pre- and post-doctoral dental students, dental society staff and other individuals interested in special care issues.

For more information, contact:

The Federation of Special Care Organizations in Dentistry
211 E. Chicago Ave., Suite 948
Chicago, Ill.
60611

Telephone: (312) 440-1660.

What's Your Seminar

Periodontal disease is a leading cause of adult tooth loss. PSR, a new Periodontal Screening and Recording method, means early detection to reduce the risk and improve your patients' dental health.

Q Why has the CDA endorsed PSR?

A Preventative periodontal care is an important issue for Canadian dentists. As an integral part of our professional services program, the Canadian Dental Association and the Canadian Academy of Periodontology, with generous sponsorship from Procter and Gamble Inc., has created a series of seminars to introduce a new periodontal evaluation system that quickly screens patients for periodontal disease and records the results simply and easily. PSR is just one more way CDA is helping you enhance patient care and find new tools and techniques to support periodontal treatment.

Q How can I learn more about PSR?

A You and your staff can quickly learn more about this simple procedure at CDA's PSR Seminar. In addition to training by a periodontist appointed by the Canadian Academy of Periodontology, you'll receive a comprehensive starter kit. This kit includes recording stickers, helpful in-office marketing tools and background information that will help you integrate PSR into your practice and assist you with patient education.

Q How long does it take to perform PSR?

A Thanks to the special probe and simple scoring method, the procedure usually takes just 2-3 minutes. That's why it's easy to include PSR in all routine exams on adult patients.

What are the benefits for my patients?

1 Early detection

By evaluating all sites of potential risk, PSR is a highly sensitive technique that helps you detect periodontal diseases early to simplify treatment and offer patients greater peace of mind.

2 Speed

PSR takes just a few minutes to perform and can be added to routine exams without lengthening exam time.

3 Simplicity

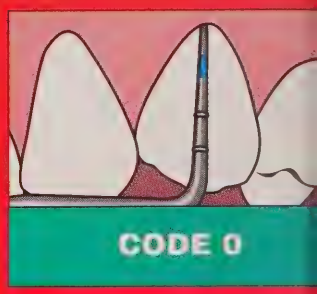
Easy to administer and understand, PSR and its simple scoring system can easily be explained to patients to enhance awareness.

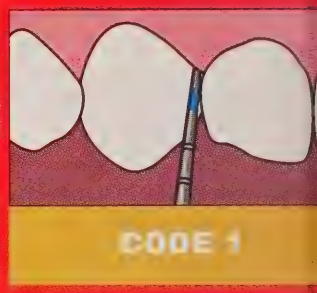
4 Cost Effectiveness

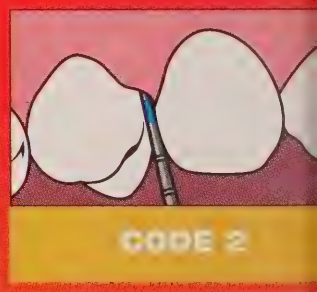
By using a simple periodontal probe designed for the PSR method, there is no expensive equipment to buy. The specially designed probes are available from a variety of suppliers.

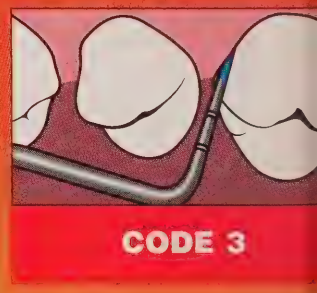
5 Recording Ease

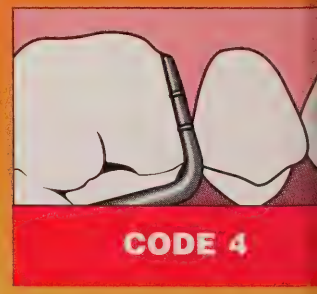
PSR requires the recording of six scores, one for each sextant of the mouth. No extensive charting or narrative is required, which means more time for patient interaction.







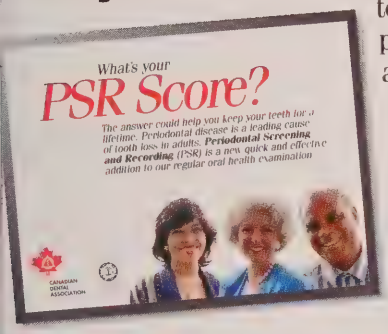




CANADIAN DENTAL ASSOCIATION

PSR Score?*

A's PSR minar kes early ection and ording simple l easy!



Through this seminar, you'll learn a fast and easy way to diagnose potential periodontal problems with the help of a specially designed colour-coded probe. You'll also learn how and when to advise periodontal care and when to schedule a full mouth periodontal examination and treatment planning.

Plan to join us today...

In order to introduce you to this essential periodontal diagnostic procedure, CDA has planned a number of seminars to be held in major centres across Canada. In addition to step-by-step training, dentists attending the seminar will receive a comprehensive PSR information kit.

But seating is limited, so don't delay. Complete and return the registration form below today or call 1-800-657-5688 and learn how the PSR program will help educate your patients about the risk of periodontal disease, simplify the recording process and save you time. Put PSR to work for you.

* Periodontal Screening and Recording, PSR, and the associated logotype are trademarks and servicemarks of the American Dental Association and related to a program jointly endorsed by the Canadian Dental Association and the Canadian Academy of Periodontology.

Sponsored by the makers of Crest & Peridex

PSR Seminars, Fall of 1995

a, ON (English)	November	2	1995	Peterborough, ON	November	30	1995	Trois-Rivières, QC (French)	December	14	1995
ry, ON	November	2	1995	Toronto, ON	November	30	1995	Sherbrooke, QC (French)	December	14	1995
York, ON	November	9	1995	Quebec City, QC (French)	November	30	1995	Chicoutimi, QC (French)	January	25	1996
Ste Marie, ON	November	9	1995	Val D'Or, QC (French)	November	30	1995	St. John, NB	February	8	1996
na, BC	November	16	1995	Montreal, QC (French)	December	7	1995	Woodstock, ON	February	16	1996
y, NS	November	16	1995	Rimouski, QC (French)	December	7	1995				

Registration Form

Seminar location: Seminar date:

Pre-registration is required. There will be no on-site registrations. Register early since enrollment is limited.

Name:

CDA Membership #:

Street:

City:

Prov.: Postal Code:

Office Tel: Residence Tel:

A receipt for the above registration fees will be issued to:

☐ Cheque made payable to the Canadian Dental Association is enclosed. (no post-dated cheques) ☐ Visa ☐ MasterCard

Credit Card #: ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Signature: Expiry date:

		Number	Total
Member dentist:	$80		$
Non-member dentist:	$120		$
Allied staff or spouse of member dentist:	$25		$
Allied staff or spouse non-member:	$35		$
Subtotal			$
GST 7% of Subtotal (#R106845209)			$
Total			$

Sign-in and light supper and refreshments at 6:30 pm. Seminar presentation at 7:30 pm.

Register Today!
Mail or Fax registration form and payment to:
CDA Member Services, Canadian Dental Association
1815 Alta Vista Drive, Ottawa, ON K1G 3Y6
Call toll-free 1-800-657-5688 or fax 1-613-523-7736

Confirmation of your enrollment will be received by mail. Cancellation policy: Full refund 21 days prior to seminar. CE Credits will apply subject to Provincial approvals pending.

CDA ACCESS ADS offer guaranteed access to Canada's largest audience of dentists. To place your ad, call ***Neil McGillivray*** *toll-free across the country at* ***(800) 413-5734.*** *In the Toronto calling area, please dial* ***(905) 278-5075.***

CDA Access Ads

Replying to a CDA Access Box Number? Simply write to:
CDA Access Box ___,
1382 Hurontario St.,
Mississauga, Ont. L5G 3H4.
Or you may fax your reply to (905) 278-4850, noting the appropriate box number.

Offices & Practices

BRITISH COLUMBIA: Orthodontist seeks practice opportunity starting July 1996. Prefers Lower Mainland or Vancouver Island. Willing to associate leading to partnership or purchase. Please call (716) 427-2708. (01/03)

BRITISH COLUMBIA - Nanaimo: One quarter share in group practice. Own building. Excellent long-term staff. Well balanced general practice. Computerized, Pan., hygienists, and located in growing north end of desirable west coast city. Phone (604) 756-0733 (evenings). (09/03)

BRITISH COLUMBIA - Burnaby: Well-established, busy G.P. office for sale in thriving Burnaby area. Four ops, average gross, $550,000 per annum in a four day week. Five year buy-out option. For the energetic and entrepreneurial in mind, this is the office! Please leave a message or fax to (604) 731-3857. (11/01)

BRITISH COLUMBIA - Vancouver: Established family practice for sale. Good growth of residential and business area. Four operatories, solo practitioner grossing 600K+ in a four day week. Will stay on for transition. Ideal for one or two practitioners. Phone (604) 921-3327 (evenings or leave a message). (12/01)

BRITISH COLUMBIA - Kelowna: For sale modern, well-equipped four op dental office in beautiful Okanagan Valley seeks specialist to lease space three days per week. Would also suit G.P. with existing patient load who wants to work a compressed work week or part-time. Great way to lower your overhead and have more personal/recreation time in a desirable area! Phone (604) 765-3532 evenings. (12/01)

BRITISH COLUMBIA
East Vancouver
For sale, established family/general practice. 10-years-old, three operatories (4th plumb),1,200 sq. ft. and approx. 2,000 active files. Excellent monthly cash flow. Associateship transition period available. Contact:
Bing C. Wong & Associates Ent. Ltd.
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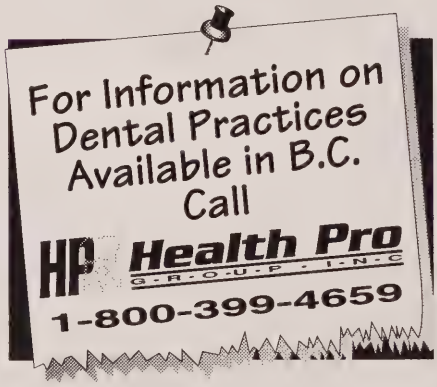

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Dental Diagnostic And Surgical Sciences
780 Bannatyne Avenue, Winnipeg, Manitoba R3E 0W2

*Applications will be considered as they are received but no later than **MARCH 31, 1996**.*

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Dr. Alan A. Lowe, Professor and Head
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Faculty of Dentistry
The University of British Columbia
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Applicants should arrange for three reference letters, as well as a detailed curriculum vitae, to be sent by February 15, 1996, to:

The Chair, Oral Radiology Search Committee
Dean's Office
Faculty of Dentistry
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124 Edward Street
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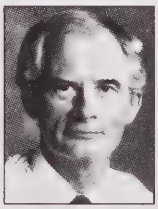

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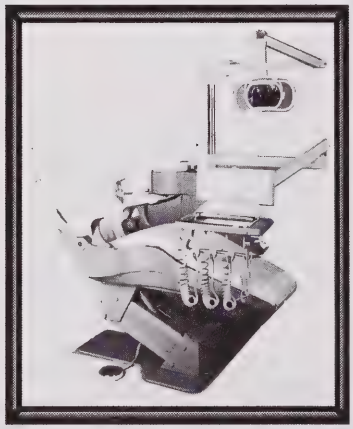

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WHY you may need treatment.
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WHY you may need a crown or bridge.
HOW crowns and bridges are done.

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HOW orthodontics is done.

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HOW TMDs can be treated.

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1. Overholser CD et al. Comparative effects of two chemotherapeutic mouthrinses on the development of supragingival dental plaque and gingivitis. *J Clin Periodontol* 1990;17:575-579
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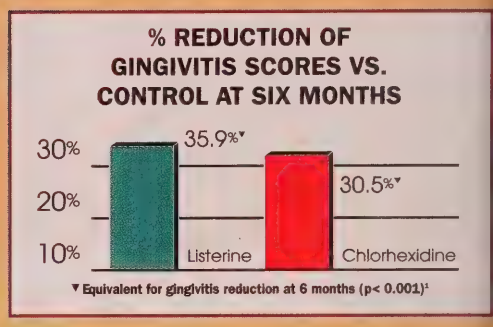

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Canadian Dental Association/
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FEBRUARY/FÉVRIER 1996
VOL. 62, NO. 2

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Dental Materials
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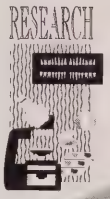
Wm. Timothy McGaw, DDS, MD, M.Sc., FRCD(C)
Jason T.H. Pan, B.Sc.



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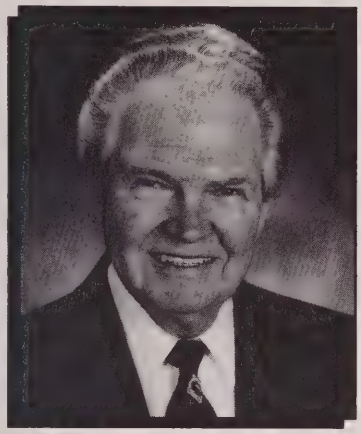
EDITORIAL

BILLIONS AND BILLIONS SERVED



Dr. P. Ralph Crawford, Editor.

Most of us have seen, and possibly been enticed, by the familiar golden arches of McDonald's and their accompanying boast, "Billions and Billions Served."

When you stop to consider how successful McDonald's is today, it makes you wonder where dentistry would be if, years ago, we had hired the same advertising agencies that made eating under the golden arches a way of life for so many Canadians — despite the 900 calories and the 40 grams of fat in a hamburger and a small fries. With better PR and a bolder message, perhaps we would not be as vulnerable to today's media flack and all the public misunderstanding that goes with it.

After all, dentists have served billions and billions of customers too, with the same sort of phenomenal success that McDonald's has enjoyed. In fact, we've been so successful at promoting both fluoridation and prevention that our profession, as we know it today, is threatened. Caries are on the run, and the days of "drill and fill" dentistry are long since gone.

Unfortunately, particularly in the midst of the current amalgam debate, dentistry's efforts to improve the quality of life of countless men, women and children are a well-kept secret outside of the profession. Instead of shouting from the rooftops how great we are, dentists are almost apologizing, as if we had done something wrong.

The problem may lie in the fact that our search for the perfect filling material has proven to be equally difficult as Ponce de Leon's illusive efforts to find the fountain of youth. Only a creator can sustain life forever, and, it seems, only a creator can create dentin and enamel.

One of the first references to the use of silver amalgam for restoring teeth occurs in Su Kung's *materia medica*, published in China in 659 AD. About 900 years later, his countryman, Li Shih-Chen, discussed a tooth-filling material composed of 100 parts of mercury to 45 parts of silver and 900 parts of tin. Since then, any number of materials have been developed for dental fillings, but none has ever served us as well as silver amalgam.

Gold may be an almost perfect dental material, but its cost and difficulty of handling negate its widespread use. And neither the gutta percha that was developed from sapodilia tree exudate in the 1850s, nor the zinc oxyphosphate and silicate cements of the 1880s, could match the ease of handling and durability of lowly amalgam.

G.V. Black gave the world its first "balanced" amalgam in 1895. And give it he did. Without personal gain or profit, he freely published his work in the August 1895 edition of *Dental Cosmos*, allowing this new amalgam to gain rapid and widespread acceptance in the dental profession. Black's formula remained virtually unchallenged until Dr. William Youdelis developed the dispersion dental alloy at the University of Windsor in the early 1960s.

The dangers of mercury exposure have been known for hundreds of years. In the 17th and 18th centuries, the huge demand for the beaver pelts required to make felt hats for the fashionable heads of Europe led to the birth of our own great nation. Unfortunately, however, felt making required workers to soak the beaver pelts in solutions of salts of mercury and nitric acid, which all too often caused the psychotic and physiological breakdowns that gave rise to the term "mad as a hatter."

Dentists have never ignored the lurking dangers of mercury. Scientific papers published a century ago in our own Canadian *Dominion Dental Journal* bear this out, and a search of the literature down through the years would undoubtedly reveal numerous other annotations. But dentistry, like medicine, must weigh risks and benefits. The current scientific consensus is that silver amalgam is safe for all but a small minority of our patients. And unless and until something better comes along, the dental needs of billions of patients should not be cast aside.

In the early 1950s, Dr. Michael Buonocore's benchmark acid-etched enamel experiments with dental resins gave dentistry a glimmer of hope for an amalgam alternative. That hope was given a boost in 1967, when Dr. Rafael Bowen, a researcher at the U.S. National Bureau of Standards, developed the first BISGMA resin composite system. Other innovations have followed, but none have come close to amalgam in terms of cost, ease of placement, and durability.

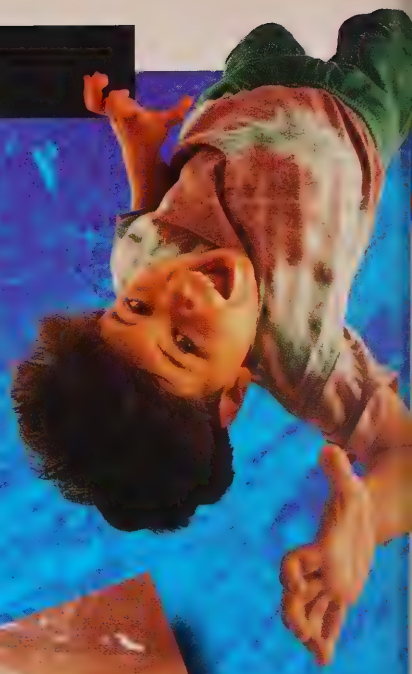
Despite this, and even though the actual physical danger directly attributable to silver amalgam is extremely rare, the jury is still out on the continued use of mercury in dental offices. Clearly, the use of amalgam will continue to be debated until final perfection is achieved.

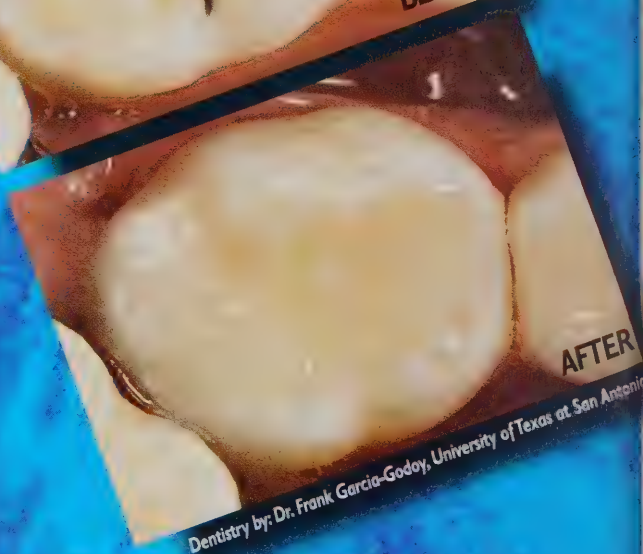
Dentistry cannot be blamed for the growing environmental danger of mercury from industrial uses. We are controlling the release of mercury from dental offices, at the same time as we continue the constant research for that perfect filling material. In the meantime, lets never stop telling Canadians how great we are. For more than 100 years, successfully and efficiently, billions and billions of amalgams have been served, and generations of men, women and children have benefited immeasurably from our care and dedication.

P. Ralph Crawford, BA, DMD
Editor of the Journal of the Canadian Dental Association

SYSTEMS FOR SUCCESS

WHEN IT'S WET AND WILD, IT WORKS!





Dentistry by: Dr. Frank Garcia-Godoy, University of Texas at San Antonio

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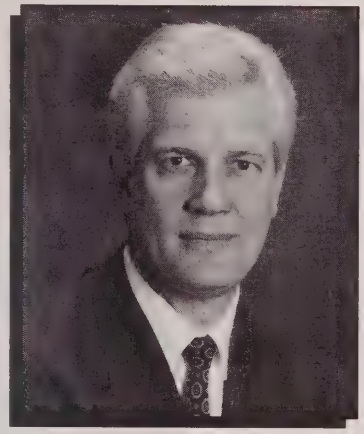
PRESIDENT'S COLUMN

OUR FUTURE IS INFORMATION



Dr. James R. Brookfield, CDA president.

We've all heard corporate Canada's latest buzzwords. Whether they call it re-engineering, right-sizing or restructuring, many Canadian companies are reassessing the way they do business, and they're taking a long, hard look at their product and service lines.

In most cases, despite all the fancy names that employers have adopted to soften the blow, the end result of these navel-gazing exercises is invariably the same. People lose their jobs. That's the reality of the '90s and the so-called jobless recovery.

Fortunately, there are some exceptions to the rule. Rather than using re-engineering as an excuse to reduce their workforce or chop product lines, some companies are using the concept to refocus their energies in new directions. They're cutting away the chaff to get to their core business, they're seeking out new opportunities, and they're paying more attention than ever to the needs and demands of the people they serve. For these companies and their workers, re-engineering has been a positive, powerful tool.

CDA recently went through a similar process. Last November, members of CDA's executive council and senior staff met in Cambridge, Ontario, to take a good, hard look at the association and what it does on behalf of Canadian dentists. We spent three difficult days defining what CDA's core business is, and reviewing our activities, programs, services, and product lines to make sure they fit that definition.

It was not an easy process. Change is always difficult. And it is doubly hard when it involves cutting existing programs, products and services. But like other successful Canadian organizations, we perceived that the time had come to cut away the chaff and refocus our energies on doing what we do best.

One of the first things we did during this year's planning session was to recognize that CDA's core business is information. By this I mean communication at all levels, public and professional education, and strong, effective government relations. Things like the *Taking Care of Business* program and the New Directions seminar series, the "Enough is Enough" campaign, the CDA Convention, the *Journal* and *Communiqué*, President's Letters on issues of importance to dentistry, the MP-Dentist Contact Program, a national strategy on dental benefits concerns, and effective issues management. Nothing we do is more important or has a greater impact on the personal and professional lives of our members.

Having come to this realization, however, we also had to face the fact that some CDA programs, products and services are not relevant to our core business. Ultimately, we determined that these items should be dropped, allowing CDA to refocus our energies in more productive areas, and to develop new information-related programs and services on behalf of our members.

Over the next few months, CDA will phase out its merchandising program, effectively eliminating our line of clothing, baseball hats, coffee mugs and balloons. We will also discontinue our "Live Bob" product line and retire "Bob" as CDA's Dental Health Month mascot. This should allow us to scale down or even close CDA's order desk, which, in turn, will free up valuable staff and financial resources for other, more important initiatives. Information products, such as *Taking Care of Business*, will continue to be available, however.

Similarly, we have served notice that we intend to end our involvement in the CDA Leasing program once the three-month notification period has expired, and we will no longer offer our Gentle Reminder office plaques. Although these programs are relatively low-cost, low-maintenance activities, the simple fact of the matter is that they are not related to CDA's core business. We do not belong in the car leasing business, any more than we belong in the gadget or the clothing business.

Where we belong is in the information business. In every survey that CDA has conducted over the past 20 years, dentists have consistently ranked government relations and communications as the most important things that we do on their behalf. This is what we do best, and it's what you expect from us when you pay your annual membership dues.

It's also why we intend to change the focus of the CDAnet*plus* program, by making on-line information freely available to Canadians through the Internet. Information of relevance to members, dentists and the Canadian public will be accessible to Internet users through a CDA home page, in much the same way that information can currently be accessed by phone or fax.

None of these changes will happen over night. Successful re-engineering takes time and energy. But by the end of 1996, CDA will be a stronger, more focused association, and I think you'll like the results.

James R. Brookfield, DDS
President of the Canadian Dental Association

BOOK REVIEWS

McCracken's Removable Partial Prosthodontics, 9th edition

edited by Glen P. McGivney and Dwight J. Castleberry

1994, Mosby-Year Book, Inc.
525 pages, 947 b&w illustrations; $98
ISBN: 0-8016-7964-8

McCracken's opus has been a standard textbook for teaching removable partial denture treatment to dental students, teachers of prosthetic dentistry, dental practitioners, and dental laboratory technicians since 1960.

Dr. McCracken's personal beliefs form the basis for the book's philosophy and format, and his sense of responsibility pervades the text. The practice of prosthetic dentistry, as the author makes clear, must remain in the hands of dentists who are competent to recognize, diagnose, and facilitate appropriate treatment. Emphasis is therefore placed on the need for a thorough examination to determine appropriate diagnosis and treatment planning, and clinical procedures are described and illustrated in detail.

Due to McCracken's conviction that there must be clear communication between the laboratory technician and dentist, laboratory prescriptions are also emphasized. The dentist is responsible for treating, designing, and delivering a satisfactory prosthesis, but the technician is responsible for demanding appropriate instructions and following them. The description and illustration of laboratory procedures is excellent throughout the book.

The book pays particular attention to the importance of secondary impressions for free-end partial dentures, and the functional registration of occlusal relationships. In particular, McCracken emphasizes occlusion and establishment of occlusion through obtained records, via accurate bases and an understanding of appropriate occlusion.

McCracken's main message is that the partial denture — properly planned, carefully made, and serviced — is not only a satisfactory restoration, but also an excellent means of preserving existing oral structures.

Drs. McGivney and Castleberry, the current editors, have placed a heavier emphasis on the need for adequate diagnosis prior to treatment. With decision analysis having finally found its way into dentistry, the need to justify treatment requires that clinicians understand why they are performing treatment rather than simply performing treatment based on habit.

Changes in this edition include a list of additional major connectors for components and replacement of the word "strap" with "connector area." Also, the discussion regarding infrequently-used internal attachments has been replaced with a discussion about attachments that are used more frequently.

New information about dental materials includes the use of tribochemical coating as a method of bonding acrylic resin to metal (silicoating), a discussion on the use of future materials for RPD frameworks, and a more detailed discussion on impression materials and their treatment for infection control. The omission of light-cured materials for trays and record bases does need to be addressed.

Updates for changes to clinical modalities include concise information on the use of the Periodontal Screening and Recording (PSR) examination to identify patients at risk for periodontal disease. The use of lasers for removal of hyperplastic tissue, the deletion of a recommendation on the application of hydrocortisone to a freshly lacerated surface, and the continued emphasis on infection control is also discussed. The final chapter has been rewritten by the new authors and includes Aramany's classification of partially edentulous maxillectomy dental arches.

This is indeed a standard textbook that continues to fulfil the requirements of basic learning, as Dr. McCracken envisioned them. There are still some inconsistencies, which may be confusing to undergraduate dental students and should be clarified in further editions. The most positive update is the introduction of the PSR.

If you own no other textbook for RPD, this one will provide good value. If you own an eighth edition, however, continue to enjoy it.

Reviewed by:
Nita Mazurat, BA, DDS
Clinical instructor, faculty of dentistry, University of Manitoba, and private practitioner in Winnipeg, Manitoba.

Failure in the Restored Dentition: Management and Treatment

edited by Michael D. Wise.

1995, Quintessence Publishing Co. Ltd.
768 pages, 1553 illustrations; $240 (US)
ISBN: 1-85097-033-5

The era of big textbooks is in full swing, and this one moves with the best of them. It is heavy, glossy, impeccably formatted and teeming with color photos.

Michael Wise, who maintains a private practice in London, England, and was educated in London and at the University of Indiana (U.S.A.), describes relevant management and treatment procedures with immense detail. In five interconnected sections, this prosthodontic album has something for everybody.

It starts with a refreshingly accurate (i.e. based on scientific evidence rather than the "it works in my hands" theory) description of the causes for dental failure. Every clinical inference includes references to appropriate bits of literature, and there are lots of both, but there is no hesitation to use disclaimers for ignorance. In the opening chapter, for example, the efficacy of periodontal treatment is pitched against the dearth of reliable diagnostic criteria. And, at long last in a restorative textbook, there is a brief but accurate review of caries, describing how some patients are susceptible and others are not, despite the fit of crown margins.

The opening section includes a useful outline of the patient management strategies employed in this upmarket practice. There are excellent examples of sensitive letters for patients, which explain everything from car parking and diagnostic plans to treatment expectations and fees — each a challenge to those of us who often take our patients for granted.

The author stays with the examination or preparation of the patient until page 149, when he switches gears and begins his description of gingival management, crown re-

Galileo™ Perfect Approach™ Commentary Number 43

Excerpted from the Galileo™ Treatment Acceptance Training™ Program

What's At Stake

I'm not a Dentist. But I know Dentists. And I know what's happening to Dentists in North America today. You are being asked to retire. Retire early. Retire now. At least as far as owning your own business. You are being asked to abandon your independent status to become part of the "corporate culture", because of course as certain experts will tell you, this is best for everybody. Thanks to the insurance industry's carefully positioned propaganda of the last 30 years, you've come to believe you can't possibly sell your services to the public without health insurance to support you. And you've come to believe you can only sell slightly any more than Insurance is willing to pay for. You've come to believe what you were intended to believe. The insurance industry has it set up so that you, your patients, the media, the government, virtually everybody, believes "you can't have health *care* without health *insurance*".

Taking it a step further, you may have read recently where Managed Care has been defended as something necessary "to protect the rights of patients". You may have read where Managed Care has been defended as something necessary "to make sure Dentists are accountable to *someone*". And I couldn't help getting an eerie feeling when I read this. Because even though I know better, the libelous intent of any such remarks kind of sticks to you even when you do know better. *"Protect patient's rights? Well, yes, I'm for that!"* I thought to myself. *"Make sure Dentists are accountable? Well, yes you'd want anyone to be accountable."*

And then I caught myself. I had been just for the moment, dragged into that shadow kind of reasoning which always seems to accompany a very bad idea dressed up in very nice clothes. The media among others is great for this. By inference and suggestion you suddenly find yourself (*and when it's done really well, you don't notice it's happening; and the people who perpetrate such don't want you to notice*), doubting the trustworthiness of the target of the innuendo. In this case, it's Dentists, it's you, reading this essay, who are supposed to start doubting each other and start wondering what kind of skulduggery must be going on behind other Dentists' closed operatory doors that would "require" Managed Care to march in and "fix it all up". But, wait a minute! Patient's rights is not an ignored subject. Various sources cover these bases intensively, regularly and consistently. Some argue they go too far. But there is no lack of "protection". And hold on again, Dentists ARE accountable, to state review boards, state government regulatory agencies, malpractice laws, etc., etc., etc. There's no super shortage of accountability at all! Someone just wants you to think there is - not consciously, but in the back of your mind, where it can fester but never be spotted for what it is - an effort to disaffect you from your own profession.

What's at stake is your willingness to go on being what you are. What's at stake is your own camaraderie, one to another, your own trust in and pride in being a Fee For Service Dentist. If anyone can break that pride, can divide your ranks and make you think you need to belong to "big corporate America" in order to justify your existence, the occupation known as "Individual Fee For Service Dentist" will cease to exist. I founded Galileo™ Treatment Acceptance Training™ because I had in my possession something called The Technology of Selling™. A No-Insult, No-Pressure, No-Mind-Game approach to Treatment Acceptance. We call it The Galileo™ Perfect Approach™ because it teaches you step by step, just like the pilot of a 747, how to make a soft landing (or, in our field a no-pressure sale of Full Care Dentistry™). Along the way, I found out what Managed Care intends for the Individual Dentist and from that day to this one, I've dedicated Galileo™ to giving you a fighting chance to survive both the insurance industry in general and Managed Care in particular. We think of you being somewhat like the "captain of the Titanic". While other programs seem to suggest redecorating the Grand Ballroom, changing the stewards' uniforms or holding an encounter session for the crew as a whole, we put all our attention on getting you to **steer hard starboard before it's too late**. Call 1-800-GALILEO to hear more. We like talking about this!

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moval, provisional restorations, impressions, occlusion, etc. Detail upon detail is offered in a gallant attempt to include every possible approach to treatment. A useful distinction is made between the objectives and methods of a confirmative treatment, where a new prosthesis conforms to existing jaw relations, and a re-organized treatment, where some ideal jaw relationship is sought. Most of the fashionable articulators get fair exposure, along with all the reasonable theories of occlusion.

Somewhere around the middle, however, the text gets to be a little too much. By page 300, I was overwhelmed. Still, on it goes. No sloppy pictures, no saliva droplet out of place, not a nose hair to distract our view of augmenting gums for the dream pontic, or moving teeth up, forward and back. Precision attachments, implants, temporomandibular disorders (facial arthromyalgia, no less), psychogenic dilemmas, pins, and even the lowly complete denture all get good showing, and usually entwined with one another.

At last, by page 579, the end of the saga is in sight, with the presentation of a brief, but honest, recognition that some problems just plain persist, and that it "only requires a relatively small number of such cases to impose severe financial hardship on the dentist." This sobering thought steadies the dental extravaganza that precedes it.

The final section, by Anthony Laurie (obviously a very talented dental technician), offers a recipe in point form to construct the prostheses that sophistication demands. It, too, is a masterful display of color and textual detail that leaves little to the imagination. It has everything that dental schools rush past and more, from the new to the repaired. There is even a discussion of sterilization and safety in the dental laboratory.

This is not just a book of failures. For the money, and for the awakening, it is worth every dollar, although some practitioners may feel that it is just a little too costly.

Reviewed by:
Michael MacEntee, PhD, LDS, Dip. Prosth., FRCD(C)
Professor and chairman, division of prosthodontics, department of clinical dental sciences, University of British Columbia.

Ultracaine® D-S / D-S forte

(articaine hydrochloride with epinephrine)

LOCAL ANESTHETIC FOR DENTAL USE.

Indications
Ultracaine is indicated for infiltration anesthesia and nerve block anesthesia in clinical dentistry.

Contraindications
Ultracaine is contraindicated in patients with a known hypersensitivity to any of its components and/or local anesthetics of the amide group; in the presence of inflammation and/or sepsis near the proposed injection site; in patients with severe shock; in patients with any degree of heart block; in patients with paroxysmal tachycardia; in patients with known arrhythmia with rapid heart rate; in patients with narrow-angle glaucoma; in patients with cholinesterase deficiency; in patients with existing neurologic disease and in patients with severe hypertension.
When Ultracaine with epinephrine is used, the caution required of any vasopressor drug is in order.

Warnings
As with other local anesthetics applied to the head and neck area, life-threatening or fatal shock, respiratory or cardiac arrest may rarely occur with Ultracaine.

Methemoglobinemia
As with any local anesthetic, Ultracaine may rarely produce methemoglobinemia: this has been observed when an intravenous regional anesthesia technique was used. Ultracaine, when used as directed in dental procedures, was not associated with methemoglobinemia.
Methemoglobinemia values of less than 20% usually do not produce any clinical symptoms. The usual clinical signs of methemoglobinemia are cyanosis of the nail beds and lips. Although the possibility of methemoglobinemia occuring in dental patients is extremely rare it can be rapidly reversed by the use of 1-2 mg/kg body weight of methylene blue administered intravenously over a 5-minute period.

Usage in Pregnancy
Animal studies have not demonstrated teratogenic or embryotoxic effects of Ultracaine. However, safe use in pregnant women has not been established. Ultracaine is unlikely to be transferred to the mother's milk since it is rapidly decomposed and eliminated.
As with other local anesthetics, Ultracaine has been shown to cross the placental barrier after peridural administration.

Precautions
General
Resuscitative equipment and drugs should be readily available when any local anesthetic is used. The safety and effectiveness of local anesthetics depend upon proper dosage, correct technique, adequate precautions and readiness for emergencies. Ultracaine should be used cautiously in persons with known drug allergies or sensitivities, or suspected sensitivity to the amide-type local anesthetics.
The following precautions apply to all anesthetics: avoid excessive premedications with sedatives, tranquilizers, and antiemetic agents, especially in infants, small children and elderly patients. Inject slowly with frequent aspirations and if blood is aspirated, relocate needle. Keep dosage, including the concentration and total volume of solution, as low as possible, with due regard to the age, weight, and physical status of the patient and the vascularity of the area injected. Absorption is greater when injections are made into a highly vascular tissue. The lowest dosage that gives effective anesthesia should be used to avoid high plasma levels and serious systemic side effects.
In children and elderly patients, as well as in patients of all ages with chronic or debilitating disease, the response to local anesthetics may be modified (see Dosage and Administration).

Patients with Special Diseases and Conditions
The use of a local anesthetic containing a vasoconstrictor in areas with a limited blood supply or in patients with peripheral vascular disease, will depend on an appraisal of the relative advantages and risks.
Ultracaine should be used with extreme caution in patients whose medical history and physical evaluation suggest the existence of thyrotoxicosis or diabetes.
Owing to the sulphite component, hypersensitivity reactions may occur occasionally in patients with bronchial asthma and, very rarely, in other patients.

Drug interaction
Solutions containing a vasoconstrictor, e.g. epinephrine, should be used with caution, if at all, in patients who are receiving MAO inhibitors or tricyclic antidepressants, because severe, prolonged hypertension may result.
Dose-related cardiac arrhythmias may occur if preparations containing epinephrine are employed in patients during, or immediately following, the administration of enflurane, halothane, or other halogenated anesthetics.

Adverse Reactions
Persistent paresthesia of the lips and oral tissues have been reported after blocking the inferior alveolar nerve.
Reactions to Ultracaine are characteristic of those associated with amide-type local anesthetics and/or vasoconstrictors.
A major cause of adverse reactions to this group of drugs is excessive plasma levels, which may be due to overdosage, inadvertent intravascular injection, or slow metabolic degradation. Other causes of reactions to these local anesthetics may be hypersensitivity, idiosyncrasy, or diminished tolerance.

Dosage and Administration
As with all local anesthetics, the dosage varies and depends upon the area to be anesthetized, the vascularity of the tissues, the number of neuronal segments to be blocked, individual tolerance and the technique of anesthesia. The lowest dosage, needed to provide effective anesthesia should be administered.
A test aspiration should always be performed before injection, in order to avoid intravascular injection. The pressure of the injection must be adapted to the sensitivity of the tissue.

	Ultracaine D-S forte		Ultracaine D-S	
Procedure	Volume (mL)	Total Dose (mg)	Volume (mL)	Total Dose (mg)
Infiltration	0.5-2.5	20-100	0.5-2.5	20-100
Nerve Block	0.5-3.4	20-136	0.5-3.4	20-136
Oral Surgery	1.0-5.1	40-204	1.0-5.1	40-204

It is recommended that the dosage should not exceed 7 mg/kg body weight in adults.

To date, Ultracaine has not been administered to children under 4 years of age, nor in doses greater than 5 mg/kg in children between the ages of 4 and 12.

Supply
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Reference:
1. Lemay H et al: Ultracaine in conventional operative dentistry. Journal of the Canadian Dental Association 1984; 50 (No.9): 703-708.

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The SLSA Program is published as a monthly feature in the *Journal of the Canadian Dental Association* as a resource for dentists wishing to enhance their dental knowledge and expertise. It is intended as a vehicle for self-learning and self-assessment. The program is based on a series of 40 questions, answers, rationales, and references, followed by an annual 15-question quiz. The 1995-96 quiz will appear in the June 1996 issue of the *Journal.* Answers to the quiz will be published in the August 1996 issue. Dentists who complete the quiz may be eligible to receive continuing education points, and their names will be forwarded to their provincial licensing bodies for consideration.

Questions 21 through 25 are a repeat of the questions that appeared in the January issue of the *Journal* accompanied with correct answers, the rationales and specific references. Question 26 through 30 are new questions — watch for their answers and rationales next month. Keep all copies of the *Journal* so you can correctly respond to the June 1996 quiz.

QUESTION 21

In non-vital teeth with periapical radiolucencies calcium hydroxide will

(1) act as an anti-microbial agent.
(2) suppress cell enzyme systems.
(3) alter the pH of the adjacent tissues.
(4) promote fibroblast proliferation, migration and healing.

A. (1) and (2)
B. (1) (3) (4)
C. (2) and (4)
D. All of the above.

ANSWER: B

RATIONALE:

Although calcium hydroxide formulations are still thought to stimulate reparative dentin and form a dentin bridge over pulp exposures there is little scientific support for the claim. Studies have shown that these formulations are valuable antimicrobials for both restorative and endodontic treatment, especially so in non-vital teeth with periapical radiolucencies. The high pH neutralises the low pH of the infected tissues and also stimulates cell enzyme systems causing fibroblast proliferation, migration, healing and repair. After severe tooth trauma the use of calcium hydroxide halts internal root resorption. A significant characteristic of calcium hydroxide is its inability to seal vital dentin against micro-leakage and it is also a poor insulator. Recent research has demonstrated the need for control of micro-leakage from dentin for management of post-operative pain as well as pulpal healing. The placing of calcium hydroxide as a liner on sound dentin serves no clinical purpose since it does not adhere to vital dentin and associated hydroxyl ions cannot penetrate the tubules to stimulate pulpal fibroblasts to form reparative dentin. Use of modern etchants, primers and resin materials causes a durable hybridised or resin impregnated layer to be formed which maintains the complete integrity of the pulp/dentin unit. This in turn benefits insulation, controls post-operative pain and ensures future pulp health.

REFERENCES:

(1) Cox, C.F. and Suzuki, S. Re-evaluating pulp protection: Calcium hydroxide liners vs cohesive hybridisation. *JADA* 125:823-831, 1994.
(2) Leinfelder, K.F. Changing restorative traditions: the use of bases and liners. *JADA* 125:65-67, 1994.
(3) *The Oral Care Report* Vol. 5. Ed. G. Nikiforuk. March, 1995.

QUESTION 22

Which of the following antimicrobial agents are used in the management of periodontal pockets by subgingival irrigation?

A. Provido-iodine.
B. Chlorhexidine.
C. Cetylpyridine.
D. All of the above.

ANSWER: D

RATIONALE:

Traditional periodontal therapy aims at resolution of the inflammatory lesion in the periodontal tissues. Such treatment involves the elimination of soft and mineralized microbial deposits on the tooth surfaces by scaling and root planing. The ideal result of periodontal treatment would be regeneration of lost attachment apparatus by the formation of new cementum, periodontal ligament and alveolar bone.

The technique of ultrasonic bacteriocidal debridement introduces surgical curettage in combination with irrigation of the pockets with antimicrobial agents. The benefit of this method of subgingival irrigation for advanced cases of periodontal disease is that the subgingival periodontal pathogenic organisms are suppressed to the advantage of postoperative healing.

Rosling et al (1986) report that use of this technique along with provido-iodine resulted in either gain of clinical periodontal attachment or prevention of loss when compared to treatment by surgical access or debridement without use of the antimicrobial agent. Other antimicrobials such as chlorhexidine or cetylpyridine are equally effective.

REFERENCES:

(1) Genco, R.J. Using antimicrobial agents to manage periodontal diseases. *JADA* 122: 122-131, 1991.

(2) Rosling, B.G., Slots, J., Christersson, L.A. et al. Topical antimicrobial therapy and diagnosis of subgingival bacteria in the management of inflammatory periodontal disease. *J Clin Periodontal* 13:975-981, 1986.

QUESTION 23

Which of the following statement(s) is/are true?

(1) Impacted mandibular third molars should be removed to prevent incisor crowding.

(2) The mean age for eruption of mandibular third molars is 16 years.

(3) Crowding of mandibular incisors can continue beyond 50 years.

(4) Patients with mandibular anterior spacing can develop incisor crowding in middle age.

(5) Mandibular arch constriction can continue beyond age 50.

A. (1) and (2)
B. (3) (4) (5)
C. (1) (3) (4) (5)
D. All of the above.

ANSWER: B.

RATIONALE:

Recent studies have shown little relationship between eruption of third molars and crowding of the mandibular incisors. The mean age for eruption of third molars is 20 years but mandibular anterior crowding continues long after this. Little et al (1988) have reported that the process of arch constriction and crowding of incisors can continue beyond 50 years. Even patients with anterior spacing can show crowding of incisors as the arch length and intercanine width constriction progresses into middle age (Little 1989). Removal of third molars to prevent incisor crowding on the theory that it will reduce interdental forces, is thus invalid.

REFERENCES:

(1) Southard, T.E. Third molars and incisor crowding when removal is unwarranted. *JADA* 129:75-79, 1992.

(2) Little, R.M., Reidel, R.A., Arthur, J. An evaluation of changes in mandibular anterior alignment 10-20 years post retention. *Am J Orthod* 93:423-428, 1988.

(3) Little, R.M. and Reidel, R.A. Post retention evaluation of stability and relapse. Mandibular arches with generalized spacing. *Am J Orthod* 95:37-41, 1989.

QUESTION 24

Pharmacokinetic changes occur with aging which affects absorption, distribution, metabolism and excretion of drugs. Which of the following are correct?

(1) Absorption is altered by a decrease in the gastric pH.

(2) Distribution is altered by a decrease in the total body fat.

(3) Metabolism is decreased by a reduced liver mass.

(4) Excretion is reduced because of lessened renal blood flow.

A. (1) and (2)
B. (2) and (3)
C. (3) and (4)
D. All of the above.

ANSWER: C

RATIONALE:

Drug concentration in the blood is dependent upon absorption, distribution and elimination. Age influences these three parameters. Although there is

an increase in pH of the gastro-intestinal tract with aging there is also a concomitant decrease in the absorbing surface and decreased gastro-intestinal mobility. Once in the blood stream, drugs distribute to various tissues depending upon their nature. In the elderly, there is a significant increase in the fat to lean body mass ratio and a decreased cardiac output compared to the younger person.

Elimination of drugs occurs by liver metabolism and/or kidney excretion, depending on the drug. Drugs excreted by the kidneys are eliminated more slowly in the elderly because of reduced function resulting from decreased blood flow. In addition, both the mass and function of the liver, including the blood flow, decrease with age. It is important, therefore, for the dentist to understand the drug related challenges that are present in the elderly and to maintain familiarity with the possible risks involved.

REFERENCES:

(1) Grymonpre, R. and Galan, D. Challenges associated with drug use in the elderly: Implications for dentistry. *J Can Dent Assoc* 57:203, 1991.

QUESTION 25

In deep cavities when an amalgam restoration is planned, a cement base must be used to

(1) provide insulation against hot and cold stimuli.
(2) prevent microleakage.
(3) decrease post-operative sensitivity.
(4) increase strength and longevity of the amalgam.

A. (1) only
B. (1) and (2)
C. (l) (2) (3)
D. All of the above.
E. None of the above.

ANSWER: E

RATIONALE:

Although in the past clinical recommendations were for the use of a calcium hydroxide liner to stimulate dentin of repair, there is no proof that this occurs. Calcium hydroxide is a useful bacteriocidal agent, however, and can be used for this purpose if it would appear clinically necessary to retain minimal residual caries to avoid a pulp exposure. None of the bases presently used is a good thermal insulator in a thickness less than 2 mm. Whilst a base of zinc-oxyphosphate, polycarboxylate or glass ionomer cement can and will restore the axial line angle and provide a flat floor to re-establish an ideal Black Class II cavity outline form these approaches are now considered dated. Recent studies have shown that unbased restorations are much stronger, decrease the potential to amalgam fracture and increase longevity. Use of modern etchants, primers and resins causes the formation of a resin impregnated layer of dentin on the cavity floor preventing postoperative sensitivity to thermal stimuli and microleakage. Such "hybridisation" of dentin should now become the modern treatment approach to the clinical problem outlined.

REFERENCES:

(1) Leinfelder, K.F. Changing Restorative Traditions: the use of bases and liners. *JADA* 125:65-67, 1994.
(2) Cox, C.F. and Suzuki, S. Re-evaluating pulp protection: Calcium hydroxide liners vs cohesive hybridisation. *JADA* 125:823-831, 1994.
(3) *The Oral Care Report* Vol. 5. Ed. G. Nikiforuk. March, 1995.

The SLSA program is a resource and service, directed to the dental profession and the licensing authorities, which is intended to help dentists achieve and maintain the high levels of expertise and competence identified by Canadian dental licensing authorities. All questions and other material are based on current, referenced literature.

Financial support for the program has been provided by A-dec, Colgate, the Fowler-Pearce Partnership (Nesbitt Burns), Nobelpharma, and Sci-Can.

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The views expressed in the questions, answers and rationales of the SLSA program are not necessarily those of the Canadian Dental Association or its related organizations.

CDA encourages Canadian dental licensing authorities to recognize the SLSA Program as an appropriate and acceptable resource for dentists seeking to earn the continuing education credits required for the maintenance of licensure.

Currently, all 10 provincial licensing bodies — British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland — recognize the SLSA program for continuing education credits.

THIS MONTH'S FIVE NEW QUESTIONS

QUESTION 26

Erythromycin affects metabolism of terfenadine. Ketoconazole reacts with terfenadine to cause ventricular arrhythmias.

A. The first statement is true, the second false.
B. The second statement is true, the first false.
C. Both statements are true.
D. Both statements are false.

QUESTION 27

Immediately following the placement of an endosseous implant to replace a single tooth, full functional loading will

(1) stimulate bone formation.
(2) result in bone loss.
(3) cause fibrous tissue encapsulation.
(4) result in epithelial downgrowth.

A. (1) only
B. (1) and (4)
C. (2) (3) (4)
D. (3) and (4)

QUESTION 28

Aspartame (an artificial sweetener) is

(1) a combination of phenylalanine and aspartic acid.
(2) less sweet than sucrose.
(3) sweeter when heated.
(4) contraindicated for persons with phenylketonuria.

A. (1) and (4)
B. (1) (3) (4)
C. (2) (3) (4)
D. (4) only.

QUESTION 29

The smear layer

(1) is 8-10 microns thick.
(2) consists of collagen only.
(3) is porous.
(4) is attached weakly to dentin.
(5) reduces post-operative sensitivity.

A. (1) (2) (3)
B. (3) (4) (5)
C. (2) (3) (4)
D. All of the above.

QUESTION 30

Sealant application to posterior composite resin restorations

(1) seals marginal defects.
(2) increases longevity.
(3) increases staining.
(4) reduces bacterial penetration.

A. (1) (2) (4)
B. (2) (3) (4)
C. (3) and (4)
D. All of the above.
E. None of the above.

(Answers to questions 26-30 will appear in next month's *Journal.*)

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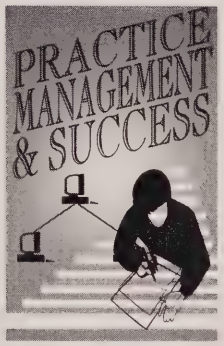

Fool's Gold

Imtiaz Manji, B.Sc.

For the past two years, I have traveled across Canada on behalf of CDA to provide practice management seminars at dental schools for students in their final year. Many of the students have come to realize that their dreams of graduating, opening a private practice and achieving instant financial security are nothing more than a "goldrush" fantasy. The parchment inscribed with DDS or DMD that they are handed on graduation day is like fool's gold. It is not a ticket to overnight prosperity.

Plain and simple, the gold in dentistry is found in practice profit. It is practice profit that pays you, supports your family and builds the lifestyle you need and want. Practice profit, in turn, is driven by your revenues and your overheads. Higher overheads result in lower profit, increased financial stress and an urgency to improve the situation.

In the survey that ExperDent performed last year, we asked dentists about their overheads. **Figure 1** shows the total overheads for practices in two groups (Eastern and Western Canada) and an overall average. Straddling the average in each column is a grey rectangle which indicates an average range where the majority of the practices we surveyed reported values. A few practices scored above the average range and a few scored below it. The average range for our survey was 62 to 84 per cent.

Figure 2 reveals the breakdown of overhead expenses into common categories. It shows that team expenses (salaries, wages and benefits) are the most significant overhead in a dental practice at 39.1 per cent, including associate costs. The next major expense is variable (supplies, instruments, etc.) at 10.3 per cent.

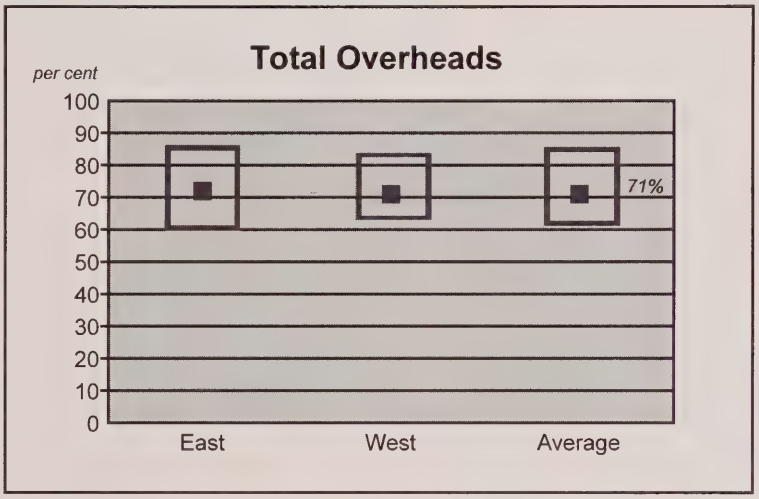

*Fig. 1 : *Does not include lab fees and expenses.*

The results of ExperDent's survey showed surprisingly high rates with an average overhead ratio of 71 per cent. Almost 50 per cent of the practices we surveyed had expense ratios higher than that level ... some as high as 80 per cent or 90 per cent. Only 20 per cent of the practices we surveyed were able to efficiently manage overheads of less than 60 per cent. That means that nearly four out of five dentists are at risk of losing a substantial portion of their take-home income in the coming years as insurance plans change and patients come in less frequently.

The overhead ratio that you deal with every month is the compound result of a myriad of decisions you have made in the past. Similarly, the benefits of controlling overheads take time to compound. Excluding lab fees and expenses, the ideal practice will work toward an overhead ratio of 55 to 60 per cent. I firmly believe this goal can be achieved by almost every practice within a four- to six-year period. The key is to make expense control a priority on every spending decision. For a practice with overheads of 71 per cent, controlling costs and reducing them by even one per cent can increase the net profitability of the practice by almost 3.5 per cent.

Carefully consider the long-term impact of every cheque you write. Are you creating a new spending pattern that respects your expense control goals, or are you reinforcing an existing pattern that does not? You've got to seek the best uses for your expense dollars and ensure that each decision is a

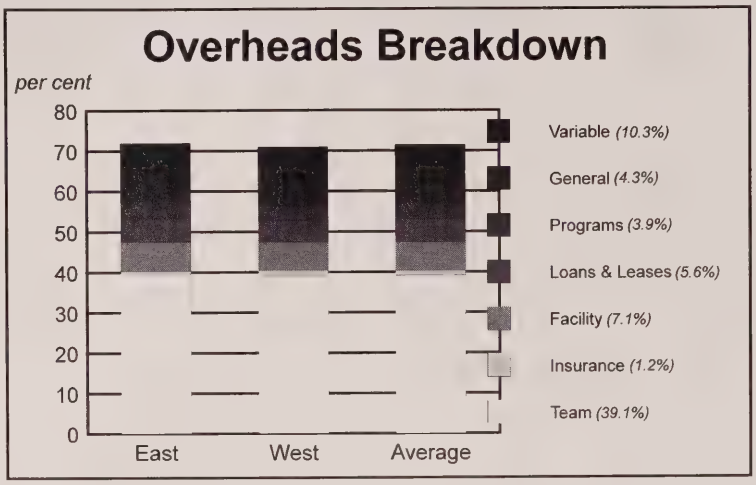

*Fig. 2 : *Does not include lab fees and expenses.*

small step toward your goal. Here are a few ideas to get you started:

- Pay down your practice debt as quickly as possible. This may have the short-term effect of increasing your overhead ratio, but once your debt is paid, your overheads will drop significantly as you enjoy practising debt-free. The average practice in our survey reported 5.6 per cent of production is used to service their debt. The same practice after paying off its debt will be 19 per cent more profitable. Remember to channel some of the profit into a reserve fund so future purchases won't require third-party financing.
- Examine your lease to determine if you are paying more than the current market rates. Consider approaching your landlord to renegotiate your lease, or moving your practice if the savings justify the effort. Another option is to cost-share your facility with another dentist by extending practice hours and/or the practice calendar. Refer to my article "Financially Free & Fifty Something" in the March 1995 *Journal* for more ideas.
- Calculate your practice's break even point and determine how many days you must work just to pay your expenses. Taking an extra day off from time to time deprives your practice of production but not expenses since most of them are fixed. As a result, your profits must absorb the lost production and your overhead ratio increases. A strict approach to planning your schedule, productivity goals and expense levels is critical.
- Consider expansion carefully. If increasing your hygiene schedule by two days per week requires an increase in administrative staffing, you may decrease your net profit. Smaller may be better so consider alternate approaches to growth. The average practice in our survey could reduce their overhead ratio by 4.5 per cent by opening the entire practice for another 3½ hours each week. This idea only succeeds when you have sufficient patients to fill the new hours without increasing downtime in the existing schedule.
- Appoint an inventory manager to handle supplies and ordering. Ensure that all clinicians standardize with each other in order to improve efficiency, reduce duplication and promote comparison shopping. Use bulk buying on standard supplies to reduce costs.

For every practice in our survey, the highest expense is team wages and benefits. At an average of 39.1 per cent, including associate costs, it is clear that controlling staff salaries is a critical component to any overhead management program. However, you must tread lightly since you are dealing with real people ... not line items. Simply stated, paycheques are sacred. You will tear your practice apart if you take rash steps to economize at the expense of your team members and their standard of living.

By all means, I urge you to carefully consider any decision to hire another staff member. Almost any action you take that can increase the efficiency and ability of your current team will be less costly than adding another salary to the payroll. A practice that efficiently automates from chairside to front desk has a better idea of expense control than an unautomated practice which hires an additional administrator to deal with paperwork. Once the equipment and training costs are paid, increasing the efficiency level of existing staff will effectively reduce overheads — any increase in employee base will permanently increase it.

Any effort to control team expenses must be implemented slowly over three to five years. Because you are affecting the lives of people you work with and depend on every day, your efforts must respect their sensibilities and acknowledge their right to be paid fairly and competitively, based on their abilities and service to your practice. It is my belief that creating a motivated, accountable team through education, good management and effective leadership naturally leads to a more productive and fiscally-responsible environment.

A DDS or DMD really is fool's gold in mismanaged practices. As I am fond of saying, "Success is hard work ... failure is harder." Expense control requires discipline to implement. It is a strategy that must be employed every working day in order to generate consistent results. Practices that defy economic realities and allow overheads to remain uncontrolled will flounder and sink in the changing dental market.

Next month, I will continue with the third article in this series by discussing how to manage your patient base in the coming years. ■

Imtiaz Manji is a principal of Exper-Dent Consultants Inc., 80-10551 Shellbridge Way, Richmond, B.C. V6X 2W9 Tel.: (604) 278-5059, or fax: (604) 278-1406.

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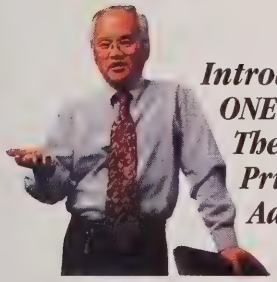

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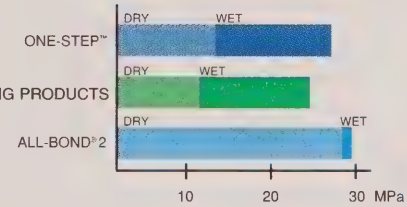

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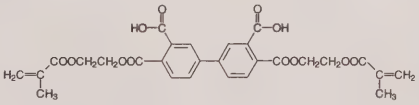

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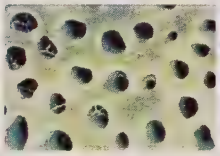

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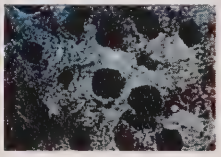

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* US Patent #5,348,988 † US Patent #5,385,728 ‡ moist does not mean saliva or blood contaminated

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Dental Benefits — Where We Stand

Editor's Note

The *Journal* is pleased to introduce a new regular column, Dental Benefits Issues. There probably isn't a topic within the dental community today that is garnering more attention. With new emphasis being placed on cost-plus direct reimbursement plans and patient education, it is a time of change and innovation. Yet, with concerns mounting over the impact that flex plans and managed care may have in Canada, it is also a time of consternation and confusion.

To meet the challenges that lie ahead, and as a service to its members and the dentists of Canada, CDA recently formed a new national-provincial committee — the steering committee on dental benefits issues.

The goal of this new committee is: "to assist dentistry to maintain control of dental care, in the interest of patients and dentists, by developing initiatives to communicate effectively with target publics, and to foster development of funding arrangements supportive of optimal oral health care."

Similarly, the goal of this new column will be to inform, educate and keep *Journal* readers abreast of the latest developments in the dental benefits area. The *Journal* extends its gratitude to Dr. David Somer, the chairman of the new steering committee, for undertaking the task of writing and coordinating the column. He will no doubt be assisted by the other members of the committee: Mr. Peter Arison, Ontario Dental Association; Dr. Brian Barrett, Charlottetown, P.E.I.; Dr. Luc Dugal, Calgary, Alberta; Dr. Richard L. Landriault, North Bay, Ontario; Dr. Maurice Simoneau, Longueuil, Quebec, and Dr. Ronald G. Smith, Duncan, B.C. Mr. Brian Henderson, CDA's director of professional services, and Ms. Linda Teteruck, director of communications, will provide senior staff support.

Readers are encouraged to write the *Journal* with their comments, questions or suggestions regarding dental benefits issues, as they impact on your practice and patients' well-being.

Dental Benefits — Where We Stand

by Dr. David Somer

Lately, we have seen tremendous pressure from dental benefits consultants, insurance companies and employers to modify dental benefits in the name of cost containment.

Canadians have been told that it is becoming too expensive for employers to provide these kinds of programs to employees and their families, and that the current structure of dental benefit plans must be changed. What most of the proposed changes have in common is that they would result in the provision of dental services on a discounted basis, and shift the risk of providing this treatment from the employers to dentists. This is what managed care is all about, and it holds true whether the vehicle of service delivery is a preferred provider organization (PPO), a health maintenance organization (HMO), or any other form of managed care program, including capitation.

Recent research conducted by CDA and its partners in the Action Plan Committee for Fair and Supportable Tax Treatment for Health and Dental Programs has shown that approximately 87 per cent of Canadians receive third-party dental and health benefits through their employers or various levels of government.

Our research also indicates that the number of Canadians who visit their dentists on a regular basis has risen from 50 per cent of the population in the early 1980s to 75 per cent today. Patients are demanding and receiving increasingly sophisticated levels of service and treatment from their dentists. In fact, preventive services have become so effective that many of our patients will never have dental caries or suffer from periodontal disease. We have been very successful at eliminating what was once the most common of all dental diseases.

There is no need to go into detail about how this success was achieved. It's no big secret. It has to do with dedication, caring and education. Think about it. Over the last 10 years, in the same period that we made so much progress toward fulfilling our mandate

to eliminate all forms of dental disease, we charged fees that increased less than the rate of inflation. The costs to employers of providing dental benefits have actually remained unchanged as a percentage of employment costs during this time.

Dentists, in turn, have absorbed increasing costs to provide services that comply with current infection control procedures. Most of us have seen our costs go up at a much higher rate than our fees. How many other professions have been able to absorb these kinds of rising costs while being able to hold the line on fee increases?

Dentistry should be extremely proud of what it has accomplished. We have educated our patients to expect high-quality dental care, and to accept the types of services that will last them right through their increasingly long lifetimes. We have encouraged them to invest their time and money in preventive services that will ultimately mean fewer expensive restorations and prosthetic services later on.

There are those who would like to see dentists penalized for being so successful. And there is no question that dentistry is a good profession to be in. Nevertheless, the fact of the matter is that the increased costs of providing dental benefits has to do with increased utilization on the part of a health conscious workforce, and not with higher fees. We are providing our services to a larger number of people than ever before.

Another factor that should be considered by employers is the actuarial tables on which premiums for dental plans are based. The tables in use today are no longer applicable. In fact, the costs of providing dental services are highly predictable, within a given group of people, under the existing third-party structure. Despite this, new dental plan concepts, such as managed care and PPOs, are being marketed to employers as a mechanism to keep costs predictable and under control. The problem is that these concepts are really designed to manage costs, not care, and they provide dentists with little or no incentive for doing what they do best — providing dental services based on a sound treatment plan.

Alternate delivery systems have been making increasing inroads in the United States. To date they have been less successful in Canada, possibly because there is no existing infrastructure here. Unlike the situation in the U.S., where private health care insurance is the norm, Canadian medical care is based on a single payer system managed by the 10 provincial governments. South of the border, it's fairly easy to add dentistry to the mix of a wider, privately-controlled medical-care system.

Another advantage that we have in Canada is the lack of restrictive anti-competition and anti-trust legislation. Our local, provincial and national dental associations have more freedom to advise dentists on managed care, and to take action to protect the interests of dentists and our patients.

So what of the future? The CDA steering committee on dental benefits issues has developed an action plan for the preservation of the existing third-party plan structure. Our approach is pragmatic, pro-active and, unfortunately, expensive. More details will be outlined in our next column. Please feel free to send in your comments, criticisms, or suggestions to the committee, or to me in care of the CDA. In the meantime, be proud of what you, as a member of the dental profession, have accomplished. ■

Dr. David Somer maintains a private dental practice in Hamilton, Ontario. He is a member of CDA's executive council and the chairman of the CDA steering committee on dental benefits issues.

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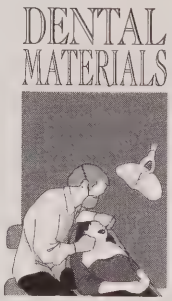
ABSTRACT



Light Cured Glass Ionomer Materials

One of the more recent advances in dental materials technology is the light cured glass ionomer restorative materials. These materials are a hybrid combination of glass ionomer and composite resin with advantages from the properties of both materials.

Although these materials are gaining widespread acceptance and use there are few clinical trials published and much is unknown about the long-term placement of light cured glass ionomers. This article outlines the properties, handling and applictions of the light cured glass ionomer materials.

Light cured glass ionomer is a hybrid composed of resin and filler, polyacrylic acid and aluminosilicate glass. There is usually less filler found in these materials as compared to standard light cured composite resin. When placed, light cured glass ionomer undergoes a dual set with the composite resin setting rapidly and the glass ionomer portion setting over a 24-hour period. The tensile strength, compressive strength, elasticity and hardness are similar to that of glass ionomer materials but less than that of composite resin materials. This material can be used with a dentin bonding agent and there is excellent adhesion to dentin. There is significant sensitivity to moisture during setting, much in the same way that standard glass ionomer must be protected from water absorption. The light cured glass ionomer materials have good biocompatibility, exhibit fluoride release, have good translucency and are available in a wide range of shades. The disadvantages of these materials is the tendency to deform under stress and function, excessive wear under function and a tendency for water absorption.

The applications for the light cured glass ionomers include small restorations, bases and liners and to augment lost tooth structure. These materials can be used for replacing lost tooth structure for crown preparations but are not strong enough for core buildups. When used for restorations, the degree of occlusal function the area to be restored will be exposed to should be considered as wear under function as high. These materials are excellent in Class V restorative situations, the restoration of root caries, small Class I or Class III lesions with minimal occlusal loading and for pit and fissure sealants.

When placing light cured glass ionomer materials a dentin conditioner should first be used to remove the dentin smear layer. The material should be handled and mixed according to the manufacturer's directions.

The glass ionomer setting reaction starts quickly so minimal placement time is required. Restorations deeper than two millimetres should be filled incrementally and cured layer by layer.

Newly placed restorations should be covered with fissure sealant or the varnish supplied by the manufacturer for the first 24 hours after placement. Petroleum jelly tends to adversely interact with some of these materials and should not be used during the initial 24-hour setting period.

The use of these materials is increasing due to the esthetics and convenience they provide. More clinical trials are necessary in order to establish their long-term clinical performance. ■

White, S.N. J Cal Dent Assoc 22:39-43, 1994.

Reprinted with permission of ***The Dentaletter*** *June:45-46, 1995.*

CDA MUSEUM donations requested

Memorabilia from CDA's 94-year history is now on display in antique cases in the library of the Canadian Dental Association headquarters in Ottawa.

As originally planned, the displays are changed on a regular basis to suitably depict different eras of our rich dental history. Donations of museum-quality dental artifacts are still being accepted and are very much appreciated. Particularly requested are larger items such as chairs, units, cabinets and X-ray machines, plus historical photos and records.

Also of interest to dental historians are the items highlighted in the column entitled "What's it?" which appears monthly in the *Journal*. This column elicits the help of readers in identifying some of the antique items presently on location in the museum.

For further information, contact Dr. Ralph Crawford at the Canadian Dental Association, 1815 Alta Vista Drive, Ottawa, Ontario, K1G 3Y6. (613) 523-1770, or call toll-free 1-800-267-6354.

NEWS UPDATE

CDA Initiates Petition Against Dental Benefits Tax

CDA is once again calling on dentists and their patients to speak out against the taxation of employer-sponsored health and dental plan premiums.

In a recent letter to all Canadian dentists, CDA president Dr. James Brookfield asked dentists to seek their patients' participation in a nationwide petition against a dental premium tax.

Mailed to dental offices across Canada in December, the petition calls on Parliament "to refrain from implementing a tax on health and dental benefits and to put on hold any future considerations of such a tax until a complete review of the tax system and how it impacts on the health of Canadians has been undertaken."

It also warns MPs that "any ill-advised tax on health and dental benefits would have an adverse effect on the oral health and overall health of Canadians."

Dentists were asked to post a copy of the petition in their reception area, inform patients about the tax issue, and return completed petitions to CDA by February 5.

The completed petitions will be forwarded to Parliament and Finance Minister Paul Martin prior to the delivery of the 1996 budget.

"I want to stress that your assistance with this petition is essential to staging an effective 1996 anti-tax campaign ...," said Dr. Brookfield in his letter. "Now, more than ever, CDA needs your help to dissuade the government from imposing this tax."

CDA is concerned by the government's apparent lack of action on the tax issue — despite our long-standing offer to work with Mr. Martin and his staff to resolve the so-called equity issue — as well with the wording of the finance minister's December 6, 1995, *Economic and Fiscal Update*. Under the heading "Non-taxation of employer-paid health and dental benefits," the document suggests that approximately eight million employees receive employer-paid health and dental benefits tax-free, and states that "the non-taxation of these benefits is estimated to have cost the federal government $1.125 billion in forgone revenues in 1992."

The update effectively ignored CDA's brief on the tax issue, which indicates that 25.6 million Canadians are covered by some form of government or private supplementary plan, and that only 3.6 million have no coverage.

CDA presented its brief to the House of Commons Standing Committee in November. The association has also launched an advertising blitz against a dental plan premium tax in *The Hill Times*, a newspaper directed toward MPs on Parliament Hill. ■

Calling all Motor Cycle Enthusiasts!

Christie Hatt, a dental receptionist from Nepean, Ontario, is making plans to hold a Motorcycle/Dental Professional Weekend during the summer of 1996.

Dentists, receptionists, hygienists, assistants, technicians and denturists from across Canada who are looking for a weekend to socialize, relax and mingle with other motorcycle enthusiasts can write Ms. Hatt at 5 Greynam Court, Nepean, Ontario K2G 5T1, or call (613) 224-7856. ■

CDA Calls For Definitive Research On Dental Amalgam

In response to a recently-released Health Canada review paper on mercury exposure and the risks posed by dental amalgam, CDA is calling on the federal government to initiate original research on amalgam safety.

"The health and safety of Canadians has always been dentistry's primary concern," said CDA president Dr. James Brookfield in a press release, "and any additional information that helps dentists fulfil this primary responsibility is welcome. But it is unfortunate that this literature review may create public anxiety when no new research is involved, and when the conclusions of this review are questionable."

CDA recently convened an international panel of experts to review the Health Canada paper. That panel's report is expected by mid-February, and will be submitted to Health Canada. It is anticipated that Health Canada will release a new policy statement on dental amalgam sometime this year. ■

CDA Ends Product Merchandising Program

Following a careful review of its programs, services and product lines, CDA will discontinue its product merchandising program.

Over the next few months, the association will clear out its stock of clothing, baseball hats, balloons "Live Bob" merchandise, and all non-information related products. In addition, "Bob" will no longer be used at the national level to promote Dental Health Month or dental awareness, and the Dental Information System (DIS) pamphlet series will be phased out.

CDA is also looking at minimizing or ending its involvement in a number of other non-information related programs. More details on the timing of the transition will be provided in future issues of the *Journal* and *Communiqué*.

The cuts, approved by CDA's executive council during its 1995 planning session, are part of a re-engineering exercise that will see CDA focus its energies on core business activities.

"We are in the information business," said CDA president Dr. James Brookfield. "That's where our real strength lies, and it's what our members expect from us."

CDA will continue to offer its successful Reaching Out seminars, as well as the three-volume *Taking Care of Business* practice management textbook program. In addition, it will develop new issue-related brochures to help den-

Fort Worth Dentist Remembers Canadian War Graves in Texas

Every two years, a general dentist in Fort Worth, Texas, remembers a group of Canadians and British soldiers who died a long way from home a long time ago.

Dr. Griffin Murphey heads a unique group known as the "Friends of the Royal Flying Corps Cemetery," which conducts a unique biennial service to commemorate the lives and sacrifice of 11 Canadian and British pilots who died in training exercises conducted near Fort Worth during the First World War.

The service is held at Fort Worth's Greenwood Memorial Park cemetery, where a stone monument rising between two short rows of thin grave markers honors the dead Canadian and British soldiers. The small 34-by-20 foot neatly-manicured plot is an official part of the Commonwealth War Graves System, and is one of only a few pieces of U.S. property owned by the British government.

This unique memorial had its beginning in June 1917, during the height of the war. An agreement between Canada and the United States allowed British and Canadian pilots to train with United States air cadets in Fort Worth, in an era when the harsh Canadian winters made flight training in open cockpit biplanes unbearable if not impossible. A reciprocal arrangement allowed U.S. Navy and Army Signal Corps trainees to use Canadian training fields in the summer months.

The Royal Flying Corps Cemetery, Fort Worth, Texas, bearing the graves of 11 First World War British and Canadian military personnel.

During 1917 and 1918, Canada, Britain and the United States trained 4,800 officers, 400 pilots and 2,500 ground crewmen at the three fields around Fort Worth. The Canadian and British pilots were from the Royal Flying Corps, later to become part of the Royal Air Force.

Thirty-eight flyers were killed during training, among them the 11 British and Canadians that Dr. Murphey and his Friends of the Royal Flying Corps remember every two years.

The next service will be held on the U.S. Memorial Day, May 26, 1997.

Dr. Murphey is particularly interested in reaching descendants of the six Canadians First World War pilots buried in Fort Worth — Cyril Albert Baker, Moose Jaw, Saskatchewan; M.E. Connelly, Vancouver, B.C.; Frederick George Hill, Blenheim, Ontario; Howard Hooten, Montreal, Quebec; Milo William Kirwan, Wallace, Nova Scotia; and James Gourley Ringland of Vancouver, B.C. He may be reached at: 1124 South Lake Street, Suite D, Fort Worth, Texas, 76104. ■

tists inform their patients about hot topics.

Other information-related products, such as the *Journal*, *Communiqué*, and *Annual Review* will also be continued, and an increased emphasis will be placed on using personalized President's Letters to keep members informed about issues of concern to the profession, such as possible limitations on the use of dental amalgam and the taxation of dental benefit plan premiums.

CDA also plans to establish a home page on the Internet to allow members to access the association on-line. Once the page is established, information of relevance to members, dentists and the Canadian public will be accessible on the Internet, as well as by phone or fax. ■

Dr. Ken Zakariasen Named California Executive Director

Dr. Kenneth L. Zakariasen, a familiar name in Canadian educational and endodontic circles, was recently appointed executive director of the California Dental Association. He will take up his new position on July 1, 1996, on the retirement of Dr. Dale F. Edig, who has held the office for 17 years.

Dr. Zakariasen, 50, received his BA, DDS, MS and Ph.D. (epidemiology) degrees from the University of Minnesota. Following positions with the department of endodontics at the universities of Minnesota and Iowa, he moved to Canada to become chairman and professor of endodontics at the University of Alberta. In July 1986, he was appointed dean and professor of endodontics at the faculty of dentistry, Dalhousie University, but he left Canada in 1992 to become dean of dentistry at Marquette University in Wisconsin. ■

Reports From Ukraine

A Manitoba dentist visited Ukraine recently to meet distant relatives — and see for himself how dentistry is being practised in a country that only recently opened its doors and aspirations to the West.

Dr. George Stolarskyj quickly determined that Ukraine is a nation of caring individuals, who are enduring great hardship to improve their lot in life within a newly created democratic society. He also found sharp contrasts between the dentistry he learned during his undergraduate years at Creighton University in Omaha, Nebraska — and in the comfortable family practice he maintains on Main Street in Winnipeg — and the dentistry in Ukraine.

During his visit, Dr. Stolarskyj visited the University of Lviv. Here, dentistry (stomatology) is taught as a medical specialty within the medical institute. On completion of the five year program, graduates intern for a year before being posted to a regional clinic, at a salary of about $40 per month. After five years of practice, they have the option of pursuing qualification in one of the country's five specialties. If they're successful, they may restrict their practices to their chosen specialty — increasing their potential earning power to about $60 a month.

There are no professional dental organizations in Ukraine, and the development, delivery and administration of dentistry is totally under the control of politicians and bureaucrats.

"Dental service is universally accessible and free in the Ukraine," says Dr. Stolarskyj, "but the quality leaves much to be desired ... Decay is rampant, periodontal disease is largely untreated, there is no community water fluoridation nor is any government effort made to educate the public about preventive dental care or hygiene. Dental treatment appears to be emergent in nature and I was struck by the number of people with swollen faces and in obvious pain."

Dental rehabilitative clinic room at the medical institute, University of Lviv, Ukraine.

A regional clinic serving outlying areas near the village of Dashava, Western Ukraine.

Although Dr. Stolarskyj believes that the training and knowledge of Ukraine's dentists are comparable to Western standards, economics and the bureaucracy of the nation make clinical advancements extremely difficult.

In the practices observed by Dr. Stolarskyj, dentists work five to six hours a day, five days a week, with patients scheduled every 20 minutes. Dental hygienists and chairside assistants are not used. Disposable products such as gloves and masks are lacking, requiring re-usable needles to be sterilized between patients.

Dental amalgam is also not in evidence. Instead, a type of composite is employed as a universal filling material and, since bonding is not used, recurrent decay appears to be a problem.

"Despite the shortcomings," said Dr. Stolarskyj, "I was fortunate to have the opportunity to observe dentists at work and to appreciate the knowledge and skills they possess when operating under such difficult and stressful circumstances. In all my discussions, I found them to be dedicated to their profession. They are cognizant of the shortcomings of their system and are patiently waiting for the inevitable political and economic reforms that will enable them to raise their standard of care to that which we enjoy in the West. Private practice, currently illegal, they feel, will be the vehicle that will enable them to overcome their current frustrations and limitations. I wish them and their nation success in their reforms, so that they may escape the legacy of the Soviet Union, and enjoy the benefits of a modern democratic society." ■

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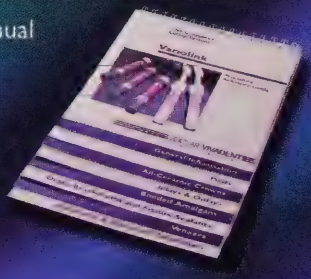

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9th Annual Medical/Dental Hockey Tournament Held In Phoenix

The 9th annual "Calnor Cup" medical/dental hockey tournament was held in Phoenix, Arizona, November 8-12, 1995, combining friendly competition on the ice with continuing dental education in the lecture hall.

Dental and medical hockey teams from across Canada and the U.S.A. competed in the popular event. The team from Niagara Falls, Ontario, won the Road Runner open division, while the Kelowna, B.C., Plaquehawks placed first in the Cactus recreational division. For information on the 10th annual Calnor Cup hockey tournament, scheduled for Phoenix November 6-10, 1996, contact John Tabachniuk of Calnor Group Tours in Calgary at (403) 299-1786. ■

Kelowna Plaquehawks: *Front row (l. to r.) Dr. Michael Wade, Dr. Gerry Braunberger, Dr. Fred Dyck, Dr. Tally Abougoush, and Dr. Bill Fair. Standing (l. to r.) Dr. Curtis Gill, Tom Dobrowloski, Dr. Brian Clark, Dr. Tom Martin, Dr. Owen Yoshida, and Dr. Stan Szombathy.*

Niagara Falls team: *Front row (l. to r.) Dr. Ernie Philpott, Dr. Frank Korody, Dr. Santi Aceti, Dr. Greg Vigneux, Dr. Roman Lysiuk, and Gord Vaughan. Standing (l. to r.) Dr. Larry Kolupanowicz, Dr. John Maletta, Dr. Cheslea MacNeil, Rodney Bush, Dr. Barry Smith, Dr. Tom Bak, and Kerry Howe.*

Dental Hygienists Broaden Horizons

News reports from several provinces indicate that the horizon for the delivery of dental hygiene services is broadening in Canada.

A story published in a recent issue of *Probe*, the official publication of the Canadian Dental Hygienists Association (CDHA), for example, describes the June 22, 1995, opening of the Mission Dental Hygiene Clinic in Kelowna, B.C.

At the clinic, which is owned and operated by a dental hygienist, dental hygienist Arlynn Brodie provides preventive and therapeutic oral hygiene care to local clients. This introduces a new treatment option in the delivery of dental hygiene care, says the article.

Recent legislative changes have made it possible for British Columbia dental hygienists to deliver preventive and therapeutic oral hygiene services, outside the regular dental office setting, to clients who have had a dental examination within the previous year. Dental treatment needs are referred to local dentists if the client does not already have a regular dentist, however.

According to Ms. Brodie, one of the biggest rewards, besides being a proprietor of her own practice, is bringing people who have not sought oral health care for many years back into the dental fold, creating a winning situation for her clients, her clinic and the dental community. For individuals whose annual oral check-ups have indeed become a visit to receive dental hygiene services, the new option means increased choice to affordable quality care, says the article.

The *Probe* story also states that in June 1995, CDHA's board of directors adopted a complementary practice position statement supporting the efforts of dental hygienists like Ms. Brodie "who are prepared to break new ground and create new avenues of access to oral health care for the public."

An excerpt from the statement affirms this position: "The CDHA supports, encourages and affirms those dental hygienists who choose to practice their profession in any environment congruent with their experience, education and interest."

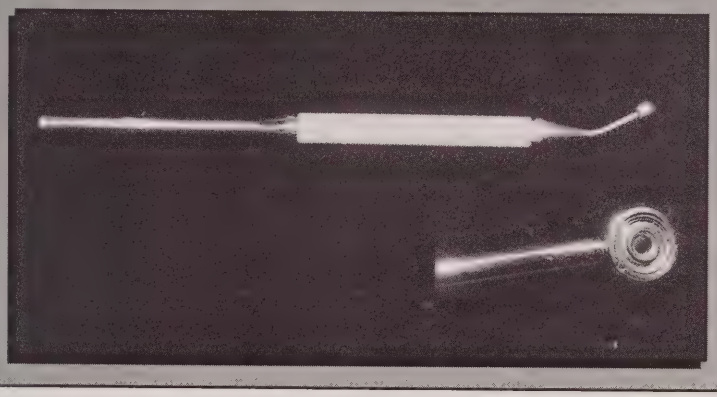
In the article, CDHA president Margery Forgay says that as the public discover they can access quality, preventive oral health care with reasonable savings through direct access to the dental hygiene profession, demands for this option will intensify.

Increased patient access to dental hygiene is also being sought by Ontario hygienists. An October 19, 1995, press release issued by the College of Dental Hygienists of Ontario (CDHO) and the Ontario Dental Hygienists' Association (ODHA) reported that a group of Ontario MPPs from all parties had been urged, during a breakfast to launch Dental Hygiene Week, to end dentists' control over the costs and accessibility of dental hygiene.

"We are concerned at the extent of control dentistry continues to exert over dental hygiene. While that control is in the best interests of

WHAT'S IT?

This 14-centimetre hand-held instrument was sent to the *Journal* by Dr. P.P. Rivest of Ottawa, Ontario. What makes this instrument unique is its peculiar head (magnified in the photo). If any reader can identify the instrument, and what it was used for, please contact the editor, Dr. P. Ralph Crawford, at: 1815 Alta Vista Drive, Ottawa ON K1G 3Y6. ■



dentistry, we feel it is not necessarily in the public interest," said Lynda McKeown, CDHO's president, in the press release.

Ms. McKeown's remarks were supported by Christine Ryan, the president of ODHA, who said: "The situation defies common sense and we look to the government to make the necessary changes to allow direct access to routine dental hygiene service."

In Alberta, the provincial dental hygienists' association has produced a 14-minute promotional video to advance the concept of independent practice for dental hygienists in that province.

Called "Open Wide," the video discusses the cost of dental hygiene services to the public, as well as other concerns. In particular, the Alberta Dental Hygienists' Association states that the fees dental practices charge are 20 to 30 per cent higher than the fees hygienists could provide in their own practices.

In a November 9, 1995, letter to its members, the Alberta Dental Association's (ADA) board of directors expressed disappointment with the nature of the video, saying that it would only strain relations between the two professional groups at the association level and in the dental office, as the Alberta Dental Hygienists' Association no longer envisions their members as part of the dental team.

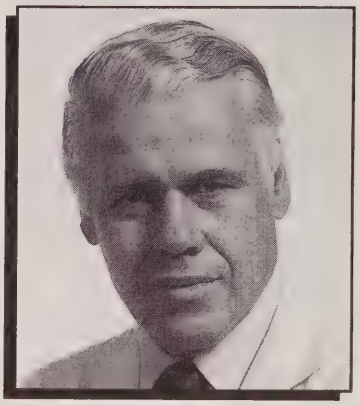
The president of the ADA board of directors has made it clear to the Alberta Dental Hygienists' Association that ADA would not stand in the way of independent practice, providing two provisos were met: a) that independent practice exist in the context of the forthcoming Health Professions Act (this new Act would insure the mandatory registration of members, a mandatory continuing education requirement, a mandatory open discipline process, and a mandatory malpractice insurance program); and b) that the range of procedures an independent hygienist could perform for the public would be limited to those being in the dental hygiene program taught at the University of Alberta, faculty of dentistry, in the 1995-1996 program. ■

RCMP Seeks Information

The RCMP detachment at Shelburne, Nova Scotia, is attempting to identify a victim of violence who may have received dental treatment in the Calgary, Alberta, area between January and June 1986.

Any dentist who has information on Scott Leaman Nickerson, born August 8, 1964, or his wife, Marina Penney, born December 27, 1966, is asked to call Constable R.D. Brackett in Shelburne, Nova Scotia, at: (902) 875-2490; or fax (902) 875-1616. ■

Dr. André Charest Dies at Age 69



Dr. André Charest, 1926-1995

Following a brief illness, Dr. André Charest passed away in Quebec City on December 8, 1995. He was 69.

Dr. Charest was born and raised in Quebec City. While earning his BA from the College Ste-Marie in Montreal, he trained with the Montreal Canadiens hockey team.

Opting to pursue an off-ice career in dentistry, Dr. Charest received his DDS from the University of Montreal dental faculty in 1952. He went on to receive graduate surgical training at the Queen Victoria Hospital at East Grinstead in England, completing this program in 1956.

When he returned to Quebec City, Dr. Charest established a private practice, which he continued until his death. During this period he served as director of dental service at l'Enfant-Jesus Hospital, a post he held for 25 years. He was also instrumental in the founding of a graduate training program in oral and maxillofacial surgery at Laval University in 1972.

Following the creation of the Royal College of Dentists of Canada in 1965, Dr. Charest was one of the first dentists to earn a fellowship by examination. In 1994 he was elected to life member status by the Canadian Association of Oral and Maxillofacial Surgeons, and was conferred a similar honor by the Quebec Association of Oral and Maxillofacial Surgeons.

Contributions to Dr. Charest's memory may be made to: Fondation de l'Hôpital de l'Enfant-Jésus (Trauma Section), 1401, 18e Rue, Quebec, Qc G1J 1Z4. ■

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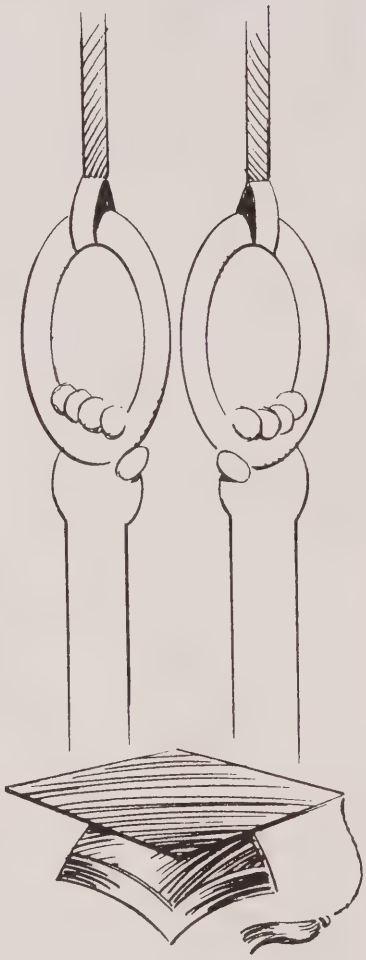

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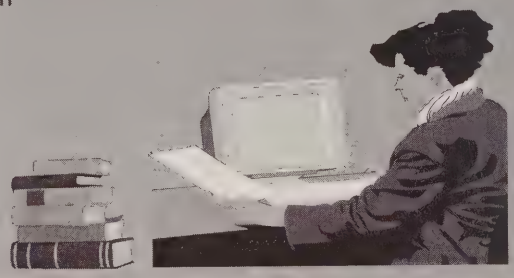

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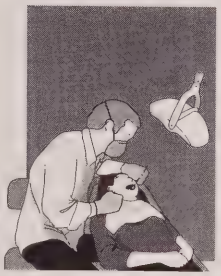


Goodbye Amalgam, Hello Alternatives?

Peter Williams, DDS, BA(Sc.), M.Sc.

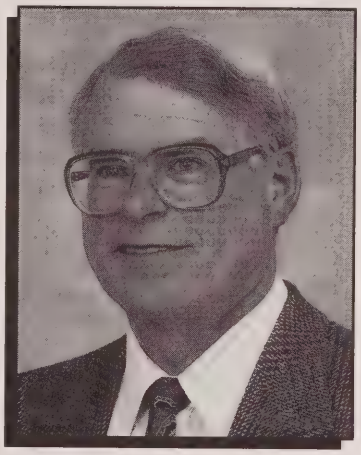
Introduction

Back in the '70s, few dentists imagined that the days of dental amalgam could be numbered, or that the *Journal of the Canadian Dental Association* would one day publish an article suggesting this possibility. Certainly not this author, who considers himself to be a strong pro-amalgamist, and with good reason.

For posterior teeth where esthetic requirements are a low priority, dental amalgam has been the favored material in restorative dentistry for more than 100 years. Although it's popularity has declined in recent years, it still continues to serve our dental needs extremely well. Restorations made from this material are durable, easy to place and relatively inexpensive. Equally important, no conclusive evidence has been found that proves dental amalgam to be a biohazard. On the contrary, innumerable articles in respected, peer-reviewed journals[1-3] attest to amalgam's safety when used properly by trained professionals.

At present, there is no other dental material that will restore posterior teeth as well and as cheaply as dental amalgam. No wonder it has retained an important place in dentistry for more than 100 years, even though research has continued to offer alternatives.

Made by mixing a metal powder composed of silver, tin, and copper with liquid mercury, dental amalgam is still considered by many dentists to be the profession's most important restorative material. Two of the primary reasons for its success



Dr. Peter Williams

— low cost and ease of placement — are in large part attributable to it being a direct filling material. Direct materials allow the tooth to be restored in one appointment, with no requirement for impression taking, temporization, or laboratory procedures. The savings in time and money associated with the direct technique are substantial. On average, the cost of a direct restoration is only about one-quarter that of an indirect restoration.[2]

Despite its positive attributes, concern about the potential mercury biohazard to patients, operators and the environment has encouraged the profession to explore the viability of mercury-free materials as alternatives to dental amalgam. The recently-released "Richardson Report,"[4] in which the author expresses concern over the mercury contributed by dental amalgam to the body burden of mercury, may further stimulate the interest in alternative materials.

This paper will review some of the existing direct materials, such as hybrid glass ionomer cements, composite resins, and gallium based alloys, that have the potential to be successful alternatives to dental amalgam.

Hybrid Glass Ionomer Materials

Hybrid glass ionomer cements and hybrid glass ionomer resins have been available to the profession for only about seven years. As their name suggests, hybrid glass ionomer restorations combine characteristics of the traditional glass ionomer cements with those of the dental resins.

Conventional glass ionomer or GI cement is formed by mixing a glass powder (calcium-aluminum-fluorosilicate) with polycarboxylic acids, such as acrylic, itaconic or maleic acids.[5] The acid partially dissolves the outer layer of the glass particles to release calcium and aluminum ions. These ions react with the acid to form calcium and aluminum polycarboxylate cement. The set cement consists of the undissolved portion of the glass particles cemented together by a matrix of polycarboxylate salts. Fluoride is also released during the setting reaction, and is subsequently available to provide an anticariogenic environment. A further advantage is that the glass ionomers bond to both enamel and dentin, as the polyacrylic acid can also react with the calcium and other components in the tooth

to bring about a weak but stable bond.

The set structure of conventional glass ionomer cement is similar to that of a composite resin, since both materials have a glass "filler" that is cemented or bonded together by a matrix composed essentially of a resin. The principal difference is that the resin in the glass-ionomer cement cannot be polymerized. Instead, it contains acid groups, which bring about setting by means of the salt-forming reaction. In contrast, the resin in the composites contain vinyl groups that bring about setting by means of a polymerization reaction.

It wasn't long before researchers realized that simply adding some vinyl groups to the glass ionomers' polymer-like acid, or mixing in a water-soluble polymerizable resin like HEMA (hydroxyethylmethacrylate), would cause the glass ionomer cements to set by means of a polymerization reaction. This creates a matrix phase that, potentially, has superior strength and solubility resistance when compared to the conventional glass-ionomers. Most of these materials use the popular light-curing technology, and are commonly referred to as "hybrid" or "resin-modified" glass-ionomer cements. However, studies done on some of the early products revealed that their strength decreased substantially as a result of water absorption.[6]

Not surprisingly, composite resins can be altered to set like a glass ionomer cement by simply adding some acid groups to the resin molecule's normal compliment of vinyl groups, and modifying the glass filler so that its outer surface will release calcium and aluminum ions to react with the acid groups. Although the terminology is still in flux, the terms "compomer," "compo-ionomer" or "acid-modified composite resin," which reflect the dual nature of these unique materials, have been suggested.

The chemistry of the compo-ionomer materials is similar to the glass-ionomer cements. Therefore, if fluoride is added to the filler, it will subsequently be released and available for cariostatic activity.[7] Although some reports indicate that the compo-ionomer materials may release substantially less fluoride than either their hybrid or conventional GI cement counterparts,[8,9] others suggest that the incidence of caries associated with the compo-ionomer is similar to that experienced with conventional GI cements, and superior to that experienced with composite resins.[10] Further, the inherent chemical bonding activity associated with the acid groups, in conjunction with conventional acid etching for resin bonding, allows these materials to bond both chemically and micromechanically to tooth structure. The bond strengths of some brands are similar to those obtained with composite resins.[11]

Currently, hybrid glass-ionomer materials range from those such as Vitrebond by 3M or XR glass ionomer by Kerr that are essentially a glass ionomer cement with some polymerizable groups, to others such as Dyrac by Dentsply that are essentially a fluoride-containing composite resin with a low level of acid-base reaction. As a result, the properties of hybrid glass-ionomer materials range from those of glass-ionomer cement (low strength, wear and solubility resistance, but good fluoride release and anticariogenicity), to those of a microfilled composite (moderate strength and wear resistance, excellent solubility resistance, poor fluoride release and anticariogenicity).

Very few clinical studies on hybrid glass-ionomer materials have been published. One study[12] reported that, at both six months and one year, the hybrid material outperformed a popular high-copper amalgam (Tytin) in both wear resistance and marginal integrity in Class II restorations placed in primary molars, although the incidence of recurrent decay was similar. The authors concluded that "after one year, no significant differences existed between the experimental material and amalgam." A six-month report[13] also concluded that the compo-ionomers would be a suitable material for Class I and II restorations in deciduous molars. These results are in sharp contrast to the rather mediocre performance of conventional glass-ionomer cements[14,15] placed in deciduous Class II restorations.

The hybrid glass-ionomers will likely provide superior performance in all situations where conventional glass-ionomers are currently used. In their present state of development, the compo-ionomer materials do not have the esthetics of composite resins, or the strength and wear resistance of either dental amalgam or certain of the posterior composite restoratives. However, they may prove to be suitable replacement materials in most pediatric cases where amalgam is now used,[16] and for adult patients in low wear areas where an anticariogenic effect is desired.

Composite Resins

Ever since their development in the late '60s, composite resins have been suggested as a possible replacement for dental amalgam. Although recent publications suggest that their clinical performance may soon reach a level that makes them competitive with dental amalgam in many applications, there are three characteristics of composite resin restorations that concern me: technique sensitivity, the rapid initiation and progress of recurrent decay, and low wear resistance relative to dental amalgam.

Technique Sensitivity

Most clinicians consider composites to be very technique sensitive.[17] The matrix used to confine a composite during its placement into the cavity must be contoured and placed so that it defines the exact outline of the completed restoration. Unlike most dental amalgam mixes, composites flow under very light forces before they set. A matrix that does not fit passively, but instead requires the pressure of the condensed material to force it into the desired shape, will spring back elastically once the condensation force is removed. If this occurs, the just-packed composite will be deformed back into the shape that the matrix had at placement. Not surprisingly, this characteristic contributes to the frustration experienced, even by capable operators, when dentists attempt to obtain a tight contact and proper interproximal contour.

Unlike dental amalgam, composite restorations are not self-sealing. They rely on the establishment of a good resin-to-tooth bond to prevent the unfortunate sequela of tooth sensitivity and recurrent decay that occur with micro-leakage. However, the routine achievement of good bonding requires a meticulous technique that is often impossible to achieve in general practice.

Good dentin bonding only occurs when the dentin surface is partially decalcified[18,19] to form a very thin collagen fibril matt. This matt is subsequently infiltrated with resin to create micromechanical bonding. The fibrils are very easily damaged by the etching procedure if it is not carefully controlled, and the thickness of the decalcified layer must be neither too thick nor too thin. Moisture levels must be carefully controlled to protect the fragile fibrils from dehydration, but not so wet that the resin cannot properly infiltrate around the fibrils. The enamel etching and dentin conditioning often require several individual steps.

In contrast, the placement of a dental amalgam requires no cavity surface treatment other than careful drying and the application of a varnish. Should the cavity walls not be dry, a well-condensed amalgam displaces the moisture so that only a thin film remains between it and the cavity wall. The narrow gap created by the moisture film is readily filled in by corrosion products. Although there may be a brief episode of tooth sensitivity, the restored tooth usually has a reasonably long and uneventful life.

Although a composite can usually be moulded into the desired shape during placement, the technique never provides the same detail and close replication of the natural tooth that a properly carved dental amalgam can. Since a composite never reaches a state where it can be carved to the shape required in the final restoration, the operator must wait until the material has hardened, then spend more time grinding in the detailed anatomy[20] using small finishing burs and abrasive stones, followed by polishing.

In contrast, dental amalgam can be carved almost immediately after it has been placed. It carves easily and cleanly, allowing the operator to quickly create a restoration surface that closely replicates the natural tooth in form and function, if not color.

Recurrent Decay

Many studies have shown that the incidence and rate of progress of recurrent decay are much higher for composite resins,[21,22] in both deciduous and permanent teeth, than they are for amalgam restorations,[23,24] particularly when longevity[25] at each year of service is compared. Other studies,[26-28] many of which likely include large numbers of the now obsolete low-copper amalgams, report a much lower incidence of recurrent decay, which is often similar to that of composite resin.

Unlike dental amalgam, which will self-seal through the formation of cariostatic corrosion products, composite resin restorations do not release cariostatic compounds nor do they create products that will plug a leaking interface. As a result, dental decay establishes itself more readily and progresses more rapidly around a composite restoration than it does around an amalgam restoration. Possibly, the use of a fluoride-containing liner or base might provide sufficient caries protection to eliminate this concern.

Wear

In areas of occlusal stress, composites generally perform less well than amalgam. The life expectancy[17,25] of amalgam restorations in Class I and II cavities is on average between six and 11 years. For composites, life expectancy is stated to be about five to six years. Since nearly 80 per cent of the wear data for composite restorations are for relatively low stress applications[25] such as Class III, IV and V cavities, composite wear values would be likely much higher if these materials were used in more demanding applications such as Class I and II posterior restorations (from which the wear values of nearly 90 per cent of amalgams are determined).

Microfilled composites are prone to catastrophic failure[29,30] as the result of fatigue brought about by the debonding of prepolymerized filler particles and the relatively high flexibility of these materials, which have a low filler content. The coarser-filled composites are subject to excessive generalized wear,[31] because the coarse filler size creates relatively large regions of soft, wear-susceptible resin between the filler particles. In addition, since the worn surface roughness is much greater than it is with hybrids or fine particle size composites, the wear rate is further enhanced.

Current practice favors the use of either hybrid or fine particle filled composites for occluding restorations. Several recent clinical studies on the use of these materials[31-34] in conservative restorations suggest that their wear rates may approach those of amalgam. The filler loading of these materials is high enough (over 70 wt per cent) and the particle size is small enough (less than 3.5 μm) to prevent both catastrophic fatigue failure and excessive localized wear at points of active occlusion.

Many brands of composites such as Z100 (3M),[27] Clearfil Photoposterior (Kurarary), P-50 (3M), Adaptic II (Johnson & Johnson), Bisfil-P (Bisco), and Litefil IIA (Shofu) appear to have acceptable wear characteristics[34,35] when they are placed in conservative cavities and function under low stress. The use of fluoride-containing liners and bases such as the conventional and hybrid glass ionomer materials may reduce the caries susceptibility to acceptable levels. Unfortunately, the technique sensitivity of these materials and their susceptibility to wear when subjected to high functional stresses may continue to make them a less attractive alternative to the plastic direct metal restorations such as dental amalgam or the recently introduced gallium alloys.

Gallium Based Alloys

Although resin-based materials such as the compo-ionomers and composite resins are viable options to dental amalgam in certain applications, neither of these materials can yet match amalgam's strength, wear-resistance and lon-

gevity as a posterior restorative material.

Another option is the recently-developed family of gallium alloys. These alloys are composed of a metal powder whose composition is very similar to that of conventional amalgam. Rather than relying on mercury as the liquid component, however, a liquid alloy composed of gallium, indium and tin is used.

The gallium alloys are direct plastic metal restorative materials that are mixed, placed and carved in an almost identical manner as dental amalgam. There have been some advances in these materials since this author reviewed them in April 1994.[36] The most important development is the recent release of Galloy (Southern Dental Industries, Australia).

In all respects, the mechanical properties of both Galloy and Gallium Alloy GF (Tokuriki Honten, Japan) are equal or superior to those of the high-copper amalgams.[37-39] The gallium alloys appear to have low toxicity,[40,41] and are not considered to pose any more of a threat to health than other well-accepted materials like composite resin, GI cements or dental amalgam. Tooth sensitivity, which was identified as an ongoing problem with Gallium Alloy GF,[42] is of less a problem with Galloy, and appears to largely disappear after about three months.[43]

Meticulous moisture control is mandatory when using the gallium alloys. Moisture contamination causes dramatic expansion of the restoration during setting[44] which can lead to tooth sensitivity and to fracturing. Corrosion, which was identified as a problem with gallium alloys early in their development,[45] continues to be a problem.[38,46] Because the unset material reacts quickly with water to form a tarnished and corroded surface, the completed restoration should be coated with a protective layer of resin to isolate it from the oral cavity until it has completely set. Since clinical experience to date indicates that unpolished gallium alloys will often tarnish and pit, these restorations should be polished at a subsequent appointment,[38] as soon as possible after placement, and possibly at intervals thereafter.

Several clinicians at the University of Manitoba dental faculty, including this author, have tried Galloy in a laboratory setting and have found it to have far better handling properties than Gallium Alloy GF. Although the fresh mix is somewhat fluid, and initially feels more like a spherical particle alloy, its "feel" rapidly changes so that it handles like a typical admixed high-copper amalgam. In contrast to the Gallium Alloy GF, which was very fluid and almost runny immediately after mixing, and which tended to adhere to the instruments during condensation,[47,48] we found Galloy easier to manipulate.

Although Galloy is initially slightly sticky, once the first increment has been condensed this stickiness is no longer present. Furthermore, the initial stickiness is easily overcome by simply wetting the condenser tip with alcohol immediately before use.

Galloy's setting rate is similar to dental amalgam's, and it can be burnished and carved immediately after condensation is complete. The feel during burnishing and carving is the same as that of amalgam, as is the finishing/polishing technique. Like all new and radically different products, these materials are experiencing growing pains. Possibly all that is required to overcome the perceived difficulties with Galloy's handling characteristics is for the operator to learn a slightly new technique or for the manufacturer to fine tune the product.

Although gallium alloys are mercury-free, in their present state of development they may not be a viable option as a substitute for dental amalgam. This author believes that the excessive corrosion of the current gallium alloys precludes their use as a suitable restorative material for permanent teeth. However, should limits be placed on the use of amalgam for children or pregnant women, a material such as a gallium alloy might well be a logical replacement.

Clinically, we would expect gallium alloy to perform as well as amalgam, except that tarnish and corrosion would be evident. The profession will have to carefully weigh this disadvantage against the advantage of this material being mercury-free. ■

Dr. Peter Williams is an associate professor and head of the dental materials section, faculty of dentistry, at the University of Manitoba. He is the *Journal's* consulting editor for dental materials.

Reprint requests to: Dr. P. Williams, Dental Materials Section, Faculty of Dentistry, University of Manitoba, 780 Bannatyne Ave., Winnipeg, Manitoba R3E 0W2.

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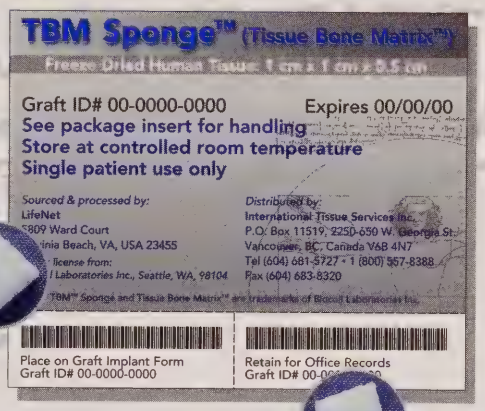

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Cancer Of The Gingiva, Buccal Mucosa, and Palate

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ABSTRACT

While most cases of intraoral cancer arise in the cancer-prone horseshoe comprised of the floor of the mouth, the posterolateral borders and ventral surface of the tongue, and the retromolar region, no intraoral site is immune. This article reviews the clinical features of squamous cell carcinoma of the gingiva, buccal mucosa and palate, as well as the less common oral malignancies that can arise at these intraoral sites.

SOMMAIRE

Bien que la plupart des cas de cancer intra-buccal se développent dans la partie en fer à cheval qui est plus sujette à cette maladie et qui comprend le plancher de la bouche, les bords postérolatéraux, la surface ventrale de la langue et la région rétromolaire, aucun site n'est immun. Dans cet article, on revoit les caractéristiques cliniques de l'épithélioma épidermoïde des gencives, des muqueuses buccales et du palais ainsi que les malignités buccales moins communes qui peuvent affecter ces sites.

Introduction

Oral cancer accounts for about three to four per cent of all cancers. It is the sixth most common cancer in men and the 12th most common cancer in women. More than 90 per cent of all oral malignancies are squamous cell carcinomas. The majority of cases are associated with tobacco use and/or excessive alcohol intake. Although the most common intraoral site of carcinoma is the tongue, usually on the posterior lateral borders or ventral surfaces, the floor of the mouth is also frequently affected. Together with the retromolar region, these areas comprise a horseshoe-shaped zone of increased cancer susceptibility, accounting for about 75 to 85 per cent of all cases of intraoral cancer.[1] Other sites of involvement, in descending order of frequency, are: the soft palate, gingiva, buccal mucosa, and hard palate. For purposes of classification, lesions of the soft palate are typically grouped with cancers of the oropharynx.

This paper will focus on squamous cell carcinoma of the gingiva, buccal mucosa, and hard palate, together with a brief discussion of some of the less common malignancies that can arise at these sites.

Gingiva and Alveolar Mucosa

About five to 10 per cent of all cases of intraoral squamous cell carcinoma occur in the gingiva and alveolar mucosa. It typically occurs in men over 60, and demonstrates a predilection for the mandibular gingiva.[2] This tumor can often mimic the benign inflammatory changes and lesions that are so common to the gingiva. Gingival cancer can cause tooth mobility, and it may be initially mistaken for advanced periodontal disease.

Typically, squamous cell carcinoma of the gingiva presents as a painless white and/or red exophytic mass with an irregular, and frequently ulcerated, surface. However, spindle cell carcinoma, an uncommon variant of squamous cell carcinoma that tends to grow rapidly and metastasize early, can present on the gingiva as a smooth-surfaced polypoid mass[3] (**Fig. 1**).

When squamous cell carcinoma of the gingiva develops on alveolar mucosa, it may give rise to a mass that wraps around a denture flange and superficially resembles inflammatory fibrous hyperplasia (epulis fissuratum).

Buccal Mucosa

The habit of chewing coarsely cut tobacco leaves (chewing tobacco) or holding finely ground tobacco leaves (snuff) in the mandibular vestibule is recognized as a risk factor for oral cancer. Nitrosonornicotine is one of a number of noncombustible products in snuff and chewing tobacco that possesses carcinogenic potential.[4] The carcinogenic hazard of smokeless tobacco use is of special concern because of the recent up-swing in consumption, particularly among teenagers.[5]

Fig. 1: Gingival carcinoma presenting as a smooth-surfaced polypoid mass.

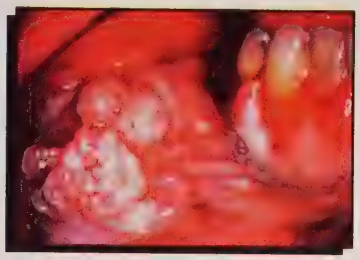

Fig. 2: Carcinoma arising on the mandibular buccal vestibule in an area of long-term smokeless tobacco use. The picture also illustrates the characteristic periodontal dehiscence that is often seen in association with smokeless tobacco use.

Fig. 3: Palatal mucosa demonstrating characteristic features of nicotinic stomatitis, together with a suspicious focal area of superimposed shallow ulceration that demonstrated dysplastic change on biopsy.

A characteristic grey-white plaque, often exhibiting a rippled or pebbled surface texture, forms on the mucosa that is in direct contact with snuff or chewing tobacco. There is often an associated (and painless) loss of gingival and periodontal tissues in the areas of tobacco contact. The periodontal changes resulting from smokeless tobacco use frequently include destruction of the facial surface of the alveolar bone. These changes typically correlate well with the quantity of smokeless tobacco used daily and the duration of the smokeless tobacco habit. The early mucosal lesions associated with smokeless tobacco use are frequently reversible with cessation of the tobacco habit, and can often regress dramatically within a two- to three-week period.[6] However, case-control studies have demonstrated an increased risk for cancer of the gingiva and buccal mucosa in habitual users of smokeless tobacco products[7] (**Fig. 2**).

Oral submucous fibrosis is a chronic oral mucosal disease seen predominantly in individuals from Southeast Asia, particularly South India.[8] The disorder has been attributed to the chewing of "pan." This mixture most commonly consists of tobacco, fragments from the Areca Catechu palm betel nut, a leaf of the Piper betel vine, and slaked lime (calcium hydroxide), which coats the inside of the leaf. It induces a mild intoxication and is habit-forming.

Oral submucous fibrosis can affect any area of the oral cavity, but the buccal mucosa and soft palate typically show the most prominent involvement. When it is present, the mucosa appears pale and smooth, often with a mottled, marble-like appearance. An associated burning sensation is often reported by the patient. The involved oral tissues become increasingly firm and stiff, with inflexible fibrous bands forming in the submucosa. The eventual outcome is a much reduced range of mouth opening. While intralesional corticosteroids and stretching exercises may be attempted to prevent further limitation of mouth opening, treatment is generally unsatisfactory.

The epithelial changes associated with oral submucous fibrosis are generally considered to be premalignant, with reported rates of malignant transformation ranging from 2.3 per cent to 7.6 per cent.[9-11]

Palate

Nicotinic stomatitis is a term used to describe the palatal hyperkeratosis that is characteristically seen in some pipe smokers. Clinically, this is characterized by a white to whitish-grey (and often wrinkled) palatal mucosa containing numerous slightly elevated papules, usually with punctate red centres. These papules represent dilated and inflamed minor salivary gland ducts.

In some South American and Southeast Asian cultures, hand-rolled cigarettes (cheroots) are smoked with the lit end held in the mouth. This "reverse smoking" produces a pronounced nicotinic stomatitis that is associated with a significant risk of palatal cancer.[12] Although the incidence of malignant transformation of nicotinic stomatitis is low with more conventional smoking practices, any associated chronic ulceration, induration, or increased nodularity should be viewed with suspicion (**Fig. 3**). Furthermore, the presence of nicotinic stomatitis should prompt a particularly careful examination of the intraoral soft tissues of the cancer-prone horseshoe, where an associated malignancy may be detected.

While squamous cell carcinoma represents more than 90 per cent of all intraoral cancers, there are a number of other less common intraoral malignancies that demonstrate an apparent predilection for the palate and/or maxillary gingiva.

Salivary Gland Tumors

Tumors of the various minor salivary glands make up nine to 23 per cent of all salivary gland tumors. Unfortunately, a relatively high proportion (about 50 per cent) of these tumors are malignant. The palate is the most frequent site for minor salivary gland tumors, with 42 to 54 per cent of all cases found at this location.[13,14]

Minor salivary gland tumors arising on the palate typically present as asymptomatic swellings. Mucoepidermoid carcinoma, adenoid cystic carcinoma and polymorphous low-grade adenocarcinoma are the three most common malignancies of minor salivary glands. When it is associated with significant mucin production, mucoepidermoid carcinoma can pre-

Fig. 4: Palatal minor salivary gland tumor presenting as a dome-shaped swelling, with surface mucosal ulceration at the apex of the swelling.

Fig. 5: Melanoma arising on the palatal mucosa.

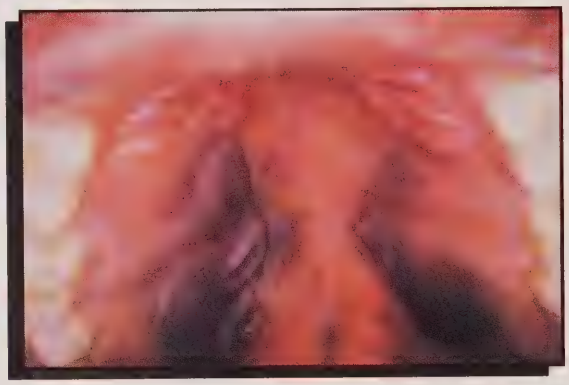

Fig. 6: Slightly exophytic Kaposi's sarcoma of the palate, with associated surface ulceration.

Fig. 7: Lymphoma arising on the palate as a broad based, smooth-surfaced swelling.

sent as a fluctuant swelling that resembles a mucocele. Tumors of high-grade malignancy, including the adenoid cystic carcinoma, tend to grow more rapidly and may be accompanied by pain and ulceration (**Fig. 4**). The adenoid cystic carcinoma has a particular propensity for perineural invasion, which probably accounts for the common clinical finding of pain in these patients.

Salivary gland malignancies are relatively radioresistant, and definitive surgical excision remains the curative therapy. Depending on the adequacy of surgical margins and the grade of the tumor, postsurgical radiation therapy is often recommended, however. In a clinicopathologic study of 160 cases, the average 10-year survival rate for these tumors was about 65 per cent.[15]

Melanoma

Almost 25 per cent of malignant melanomas occur in the head and neck region. While the vast majority arise on the skin, they may occur at any site where melanocytes are present, including the oral mucosa. While primary intraoral cases of malignant melanoma are relatively rare, 75 to 80 per cent of these intraoral cases affect the palatal mucosa or maxillary gingiva.[16]

The nodular melanoma subtype appears clinically as a darkly pigmented elevation on the mucosa. A second subtype, the superficial spreading melanoma (and a behaviorally related subtype, the acral-lentiginous melanoma), develops over several years into a well-defined pigmented patch (**Fig. 5**) that, after several years of centrifugal growth, enters into an invasive or vertical growth phase and metastasizes. Early excision of the superficial spreading form carries a better prognosis.

Amelanotic forms of malignant melanoma have been reported on the oral mucosa, contributing to diagnostic difficulties. These lesions typically present as non-pigmented nodules, and histological diagnosis is predicated on electron microscopy and/or immunocytochemistry.[17]

Oral malignant melanoma has a worse prognosis than its cutaneous counterpart. Surgical excision is the only curative treatment. Unfortunately, about 50 per cent of patients show evidence of metastasis at the time of initial diagnosis.[18] The prognosis is very poor for this group of patients, with a five-year survival rate of about five per cent.

Pre-existing benign melanosis is reported to be present in approximately one-third of oral malignant melanoma cases,[19] and there is general agreement that benign melanocytic nevi of the oral cavity should be excised where possible.

Kaposi's Sarcoma

Kaposi's sarcoma (KS) is a malignant neoplasm derived from endothelial cells. Before the advent

of the acquired immunodeficiency syndrome (AIDS), it was a rather rare tumor, generally affecting the skin of the leg in elderly males, typically those of Mediterranean origin. In AIDS-related Kaposi's sarcoma, however, the disease predominantly affects young homosexual men and exhibits a predilection for the head and neck region. Oral lesions are present in 50 per cent of these cases,[20] and it is not uncommon for oral lesions to occur in the absence of other sites of involvement. The hard palate and gingiva are the most commonly affected intraoral sites.

In Kaposi's sarcoma, lesions typically begin as flat brown or reddish-blue areas that do not blanch on pressure (**Fig. 6**). In time, these areas evolve into plaques or nodules that may subsequently develop surface ulceration, with associated pain and bleeding. A biopsy is required to make the definitive diagnosis. The specific factors responsible for the endothelial proliferation giving rise to Kaposi's sarcoma have not been fully elucidated. There is evidence to implicate cytomegalovirus and other herpes-like viruses, but a causal role has not been definitively established.[21,22]

The objective of therapy for oral lesions of KS is usually palliative, and is primarily concerned with the control of pain and bleeding, and improving function. KS responds to relatively low-dose radiation therapy (800 to 1,500 cGy).[23] Intralesional injection with vinblastine has also been shown to be an effective means of managing oral lesions.[24] Laser excision is sometimes used.

Lymphoma

Lymphoma is commonly found in the head and neck region, and can arise in extranodal sites, including the oral cavity. While malignant lymphoma in the oral cavity is uncommon in the general population, the HIV epidemic has had a major impact on the incidence of this disease.[25] Oral lymphomas, almost exclusively of the non-Hodgkin's type, are a recognized complication of AIDS. The current hypothesis on the pathogenesis of HIV-associated B-cell lymphomas involves a complex interaction of T-cell dysfunction, Epstein-Barr virus infection, and antigenic stimulation.[26]

In patients with AIDS, lesions tend to be aggressive, high-grade B-cell lymphomas.[27] The intraoral lymphomas typically present as a rapidly growing mass of the palate or gingiva (**Fig. 7**).[28] Although many patients may achieve clinical remission in response to chemotherapy and/or radiotherapy, a cure is rarely achieved because of the usually widespread nature of the malignant process.[29]

Summary

The principal role of the dentist in the management of oral cancer remains recognition and early diagnosis. While most cases of intraoral cancer arise in the cancer-prone horseshoe comprised of the floor of the mouth, the posterolateral borders and ventral surface of the tongue, and the retromolar region, no intraoral site is immune. Practitioners must be aware of the range of clinical presentations of oral cancer, including the less common intraoral malignancies that demonstrate a propensity for involvement of the gingiva and palate. In conducting the soft tissue examination of the oral cavity, it is essential that practitioners maintain a high index of suspicion for malignancy. ■

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The Interim Meeting of the Board of Governors of the Canadian Dental Association will be held March 29 and 30, 1996 (Friday and Saturday), at the Westin Hotel, Ottawa, commencing at 9:00 a.m.

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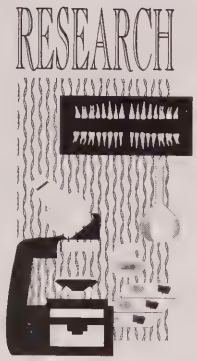

Current Trends In Guideline Development: A Cause for Concern

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ABSTRACT

Although the development and use of practice-related guidelines as educational aids has a long history in the health professions, scientific assessment indicates that they have had limited success in changing practice patterns. This is principally due to the exclusion of practitioners from the development process, and the lack of a credible scientific basis for many guidelines. Past failures have led to new methods of guideline development based on a critical analysis of scientific data. These methods, which involve legitimate professional organizations at all stages of the development process, are clearly a step in the right direction. Unfortunately, there are signs that current guideline developers still fail to recognize the critical nature of the new methods or the need for an open and inclusive development process. It is even more disquieting that the objective of some guideline developers, such as licensing bodies, is the formulation of standards or review criteria, particularly when there are very few therapeutic practices with a sufficient scientific basis to justify such a designation. National and provincial societies, as well as dental educators, need to assume a leadership role to ensure that if guidelines are required, they will be developed as credible aids for the improvement of patient care.

In this paper, the authors recount why the "traditional process" of guideline development resulted in guidelines that were mistrusted by the profession and, as a result, ineffective. They also outline the widely-documented current methodology, which should be followed if guidelines are to be accepted by the profession. Finally, they discuss the critical issue of who should develop guidelines, and examine their role in dental practice and education.

SOMMAIRE

Bien que, dans l'exercice des professions de la santé, la formulation et l'usage de directives comme moyen d'éducation remontent loin dans le passé, des études scientifiques révèlent qu'elles ne réussissent guère à changer les habitudes. Cet échec est principalement dû au fait qu'on n'invite pas les praticiens à participer à la formulation de ces directives et que, souvent, celles-ci manquent de fondement scientifique. Aussi a-t-on eu recours à d'autres méthodes pour en formuler à partir d'analyses critiques de données scientifiques. Ces méthodes qui font appel à des organismes professionnels officiellement reconnus pour coordonner tout l'exercice de formulation, sont nettement un pas dans la bonne direction. Malheureusement, des indices font croire que des auteurs de directives actuels ne reconnaissent pas encore l'importance des nouvelles méthodes ou le besoin d'un mode de consultation ouvert incluant toutes les parties concernées. Il est encore plus troublant de constater que l'objectif de certains, comme les organismes de réglementation, soit de formuler des normes ou des critères de révision, surtout lorsqu'il y a très peu d'usages thérapeutiques avec des notions scientifiques suffisantes pour justifier une telle appellation. Les sociétés nationales et provinciales ainsi que les enseignants en dentisterie doivent prendre l'initiatives pour s'assurer que, si des directives sont nécessaires, elles seront formulées comme des moyens fiables pour améliorer le soin des patients.

Dans cet article, on raconte comment la «procédure traditionnelle» pour formuler des directives a entraîné la méfiance chez les professionnels. Aussi sont-elles restées inefficaces. À l'aide de nombreuses références, on explique également la méthodologie actuelle qui devrait être suivie si l'on veut que les directives formulées soient acceptées par les professionnels. Enfin, on débat la question critique de savoir qui devrait formuler des directives, et on étudie leur rôle dans l'exercice et l'enseignement de la dentisterie.

Introduction

Although professional organizations have developed and used practice-related guidelines as educational aids for many years, the growing complexity of health delivery has led other groups, such as government health ministries, licensing bodies, insurers, and others, to become increasingly involved.[1-3] Since each of these groups may

have a different agenda, the profession should not presume that their intent is to develop and use guidelines as a benign form of continuing education.[2] Today's guidelines may assume a considerably more intrusive role, becoming standards of practice or review criteria for use by licensing bodies, discipline committees and payer groups.

More than 1,200 practice-related guidelines have been published in Canada and the United States in response to medical issues.[1] Fewer guidelines have been developed for dentistry, but the pressure for more is evident.[4,5] In anticipation of such an increase, the dental profession should carefully examine the concept of practice-related guidelines, and become actively involved in the development process to ensure that the objectives of guideline developers are consistent with the interests of both patients and practitioners.

Why Guidelines Fail

The process and the outcomes of past guideline development in both medicine and dentistry have been assessed in a considerable body of literature. While there have been some notable successes, in general the impact of guidelines in changing practice patterns has been limited.[6,7]

Practice-related guidelines were developed in response to various studies showing significant variations in the use of specific medical and surgical treatments in different geographical areas, as well as evidence showing an overuse of services such as laboratory tests, drugs and radiography.[7] It was believed that guidelines defining appropriate indications would help physicians make better clinical decisions, and thus improve the quality of patient care. According to retrospective studies, however, there is very little evidence to indicate that guidelines have achieved this objective.[6,7]

The reasons for the lack of success of practice-related guidelines were identified by the retrospective studies. In effect, the fundamental flaw in what has now been termed the "old process" of guideline development was that practitioners were not directly involved.[2,7] The process was often secretive, and until the resulting guidelines were published in professional journals, only a few members of the profession were aware of the initiative. At the same time, the published document revealed neither the composition of the group responsible for developing a guideline, nor any details of the method used. Scientific references were not usually attached, and there was little, if any, consultation or review with the profession prior to publication.[7]

CDA's "Guidelines for the Control of Radiation in the Dental Office," which were first published in the *Journal of the Canadian Dental Association* in 1984, provide a classic example of this process.[8] These guidelines were consistent in content with those published by the American Dental Association in the 1980s.[9] The only information which accompanied the article was a brief preface stating that the guidelines had been adopted by the CDA board of governors in September 1983. It failed to identify the authors of the guidelines, there was no description of the method employed, and there were no scientific references.

In fact, the draft document was produced by the health-care council of the CDA.[10] It was reviewed by a consultant in dental radiology and forwarded to the provincial licensing authorities for review and comment. There was no consultation with teaching institutions, specialty societies, or the profession at large.

The exclusion of the dental schools from the development process was critical. Although the concept of selective radiography, as advocated in the guidelines, was adopted as CDA's official policy, it actually contradicted the teaching practices in 81 per cent of dental schools in Canada and the U.S.[11] The accepted doctrine at that time held that the routine radiographic survey was an essential prerequisite to the clinical examination. Furthermore, surveys conducted in the 1980s and '90s to determine the radiographic practices of dentists in Canada and the United States showed that the guidelines did not significantly change the prescribing practices of general dentists or those in the dental schools.[12-14] The obvious failure of these guidelines in both countries is attributable to a failure of process.

Current Methods for Developing Guidelines

The failure of guidelines developed using the "old process" to significantly affect practice patterns led the medical profession to implement new, well-defined procedures for producing guidelines.[1,7,15] In 1991, the Canadian Medical Association (CMA) created an umbrella organization — The National Partnership for Quality in Health (NAPAQH) — to coordinate and facilitate the clinical practice-related guideline process.[3] This initiative also responded to a concern in the medical profession about the active but uncontrolled growth of guideline development. At that time, more than 40 organizations were producing guidelines, and more than 400 clinical practice-related guidelines had been published in Canada.

Believing that guiding principles were required to produce effective, quality guidelines, NAPAQH published a document entitled "Guidelines for Canadian Clinical Practice Guidelines."[3] NAPAQH is a collaborative effort that includes the provincial divisions of the CMA, as well as the colleges, specialty societies, health associations, and several government departments of health. Most, if not all, legitimate stakeholders are involved in the organization and in its decisions. This type of involvement is clearly essential to ensure that the guidelines developed by NAPAQH are credible to the various sectors of the health professions.

According to the NAPAQH document,[3] the principles that should govern guideline development, can be summarized as follows:

1. The purpose of clinical practice guidelines (CPGs) should be improvement in the quality of health care.
2. Guidelines should be sufficiently flexible to allow patients and clinicians to exercise judgment in the choice of treat-

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1 Hunter FM, et al. Development of a disposable pressure sensitive periodontal probe and comparison of probing forces. J Dent Res 1990;69: Abstract #277
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Table I

Quality of Evidence and Strength of Recommendations*

A. Evidence:
I. Evidence from at least one properly randomized controlled trial.
II. Evidence from at least one well-designed clinical trial without randomization, from cohort or case-controlled analytic studies, preferably from more than one centre, from multiple time series, or from dramatic results in uncontrolled experiments.
III. Evidence from opinions of respected authorities on the basis of clinical experience, descriptive studies, or reports of expert committees.
B. Recommendations:
A. Good evidence to support a recommendation for use.
B. Moderate evidence to support a recommendation for use.
C. Poor evidence to support a recommendation for or against use.
D. Moderate evidence to support a recommendation against use.
E. Good evidence to support a recommendation against use.

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ment or tests, and reflect the many variables expected in individual patients.

3. CPGs should be developed by the profession in collaboration with all those groups, including patients, which will be affected by the specific subject of the guideline.
4. CPG developers should determine the objectives, methods and the user group of the guideline before it is developed.
5. CPGs should cite specific scientific evidence and grade the strength of the evidence.
6. Before implementation, the CPG should be reviewed by expert panels and user groups. Field trials should test the recommendation where appropriate.
7. A standardized format should be used for publication.
8. There must be a mechanism for review and revision of the document.

Within the guiding framework of such principles, several variants exist in the new methodology for guideline development.[1,2,7] One of the most stringent of these is the "Evidence-Based Medicine" concept developed for CMA.[16] This process relies more on scientific evidence than opinion. In short, the quality of the available scientific evidence is graded, and guideline recommendations are then classified according to the quality of this evidence (**Table I**). An example of the relationship between the quality of the evidence and the strength of the recommendations produced by The Canadian Task Force on the Periodic Health Examination for three public health problems is shown in **Table II**. The final step in the CMA process is a structured publication format that reflects all stages of the new process. Under this format, the guideline document details precisely the objective, the sponsors, the composition and qualifications of the developers, and the details of the scientific data, including selection and analysis.[1,19]

Prerequisites For Guideline Development

Before embarking on guideline development, past experience indicates that certain essential steps must be undertaken. It is vitally important to first identify areas where guidelines could be effective in improving care, such as those where a choice of therapeutic methods is available to treat a particular problem. In situations where one method yields a superior outcome in patient health, cost or efficiency, a guideline based on an assessment of the available scientific evidence can be a persuasive tool in changing customary practise. Where there are a variety of treatment choices, but no clear differences in patient benefit, cost or efficiency, guidelines serve no useful purpose. Finally, the development of guidelines on most of the common procedures is unnecessary, unless there is evidence of widespread inappropriate use.

The need to choose appropriate guideline topics is so critical that in Ontario, in 1992, the Institute for Clinical Evaluative Sciences (ICES) was jointly created and funded by the Ontario Medical Association and the Ontario Ministry of Health to address this need.[20] Its role is to collect scientific data on practice patterns and treatment outcomes that will lead to the identification of appropriate topics for guideline development. This institute is similar to the Agency for Health Care Policy and Research established by the U.S. Congress in 1989.[7] The level of funding of such agencies and institutes emphasizes the fact that, in medicine at least, guideline development is expected to be a carefully designed and scientifically managed process. No such organization exists in Canada to assist the dental profession.

The second prerequisite of a guideline development strategy is to determine the composition of the body directed to produce the guideline. It is generally accepted that no one group, especially licensing bodies, should be responsible.[7] There is also evidence to suggest that specialty societies, insurance companies, and any other group with special interests have difficulty in divorcing their self-interest from the general interests of the profession and the public.[7] The panel should represent all legitimate interests, but also include members who can provide impartial resources in areas such as biostatistics and health-care economics.

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Table II

Evidence-Based Guidelines for Three Medical Conditions*

Condition		Quality of evidence	Procedure	Strength of recommendation
Cancer of the breast	≤ 40 years	III	Teaching breast self-examination	C
	40-49 years	III	Annual physical examination of the breast	C
	50-59 years	I	Annual mammography and physical examination of the breast	A
	≥ 60 years	II	Annual mammography and physical examination of the breast	B
Smoking		I	Short counselling and follow-up visits; nicotine chewing gum could be prescribed only as an adjunct	A
Primary open-angle glaucoma		III	Measurement of intraocular pressure Funduscopy Visual-field testing	C

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A final prerequisite is a public statement of the developing body's objective, prior to its beginning work on a guideline, so that the intent is clear to practitioners. If the intention of the developers is to assist practitioners in providing optimal care, while identifying inappropriate care, then the guideline should be identified as a "practice parameter," for example. However, if a guideline is intended not only to define the appropriateness of care, but also to judge practitioners on its application, then it must be labelled a "standard" or "performance measure" or "review criteria."[6] A vast difference of meaning is implicit in these definitions.

Assessing the Role Of Guidelines In Dentistry

There is considerable variation in treatment recommendations for many diseases, which suggests that some treatments, procedures or tests may not be appropriate.[7] The fact that hundreds of guidelines have been developed and that most professional, institutional and governmental bodies are actively engaged in producing more, is evidence of a widespread belief that guidelines are the solution to this problem. Notwithstanding this fact, studies in the medical and dental literature indicate that most therapeutic procedures do not have a sufficient scientific basis to support the development of credible guidelines.[5,6] Therapeutic recommendations often rely heavily on unreliable anecdotal evidence, and few treatments have been tested by randomized clinical trials, which is the highest level of evidence necessary for validation. For example, the lack of consensus on the incidence, etiology and treatment of myofascial pain is directly related to limited scientific data, and especially to the lack of credible treatment outcome studies.[5] A recommendation developed by the exacting principles of current methods could only focus attention on the fact that little scientific evidence exists in this area and that studies are needed.

There are examples of successful guideline development, however. The American Heart Association (AHA) recommendations for antibiotic prophylaxis provide a typical example of a guideline developed in response to a complex topic. Given the complexity and scope of current data in this area, an individual clinician or teaching institution would have difficulty in evaluating the extensive literature and in making a judgment regarding appropriate procedures. The AHA guidelines solve this concern. Equally important, they are not static directions, but are subject to periodic review and validation. The guidelines have actually changed many times as new data became available, and practitioners who follow them trust that these changes have occurred because all relevant data have been assessed by an appropriate panel. Confidence in the quality of the guidelines and the credibility of the group that produces and revises them is essential for their acceptance. In medicine, publicly supported national associations such as the AHA can offer the funding and administrative support to promote guideline development in their area of interest. For dental health problems, however, no such organization exists.

In Ontario, the Royal College of Dental Surgeons (RCDS), through its Quality Assurance Committee, is actively developing practice-related guidelines. There is no published information to indicate that the Ontario Dental Association (ODA), the dental schools and the specialty societies are officially involved as equal partners in the process. Of even greater concern is the preface that accompanies all of the college's recently-published guidelines: "College Guidelines contain practice parameters and standards which should be considered by all Ontario dentists in the care of their patients. It is important to note that these Guidelines may be used by the College or *other bodies* (our italics) in determining whether appropriate stand-

ards of practice and professional responsibilities have been maintained."[21] No indication of which parts of the document are standards and which are practice parameters is given.

In our view, if practice-related guidelines are indicated, they should be national in scope. Even though the 10 provinces have constitutional responsibility for health care in Canada, it makes no sense to have both replication and differences in the guidelines for common treatment methods issued by each jurisdiction. For example, CDA's guidelines for infection control differ significantly in important respects from those in effect in some provinces.[10] In dentistry, unfortunately, we do not have organizations, such as the American Heart Association, or funded institutes with the resources and skills to perform the research that must precede the development of effective guidelines. There is no association, either national or provincial, that, by itself, could organize, fund and execute the process of developing valid, credible practice guidelines for dentists. In our opinion, however, the consequences of allowing the current unorganized growth of guidelines to continue poses such a serious threat to the profession that national organizations such as CDA, the Association of Canadian Faculties of Dentistry and the specialty societies, along with the provincial dental organizations, need to assume a leadership role in defining how this development should be managed.

Another concern is the impact of guidelines on medical and dental education. Teaching or practising based solely on the basis of clinical guidelines would limit reasoning and independent thought on the rationale for the therapeutic choices that are essential to the management of individual variations in patients.[6] One of the fundamental differences between a training school and a university program is that the latter encourages the development of arguments and hypotheses that challenge and question traditional practices.

How will academic functions be affected if a licensing body of a self-regulated profession develops guidelines, pronounces them to be standards of practice, and institutes enforcement procedures to ensure compliance? Unless scientifically sound, such recommendations should not and would not be included in the dental curriculum.

It is extremely disquieting that organizations, especially licensing bodies — apparently without an understanding of the critical need for the participation of all legitimate sectors of the profession and a precise definition of the purposes for which the recommendations are intended — are currently producing practice-related guidelines. Our greatest concern is that guidelines based on opinion or consensus will be converted into standards that define "right" or "wrong" practice. Unless the scientific basis of a guideline is unassailable, which is rarely the case, such certainty is not justified. If dentists are to be judged by guidelines purporting to be standards, the profession must be confident that the process is credible and that the end product is scientifically valid. ■

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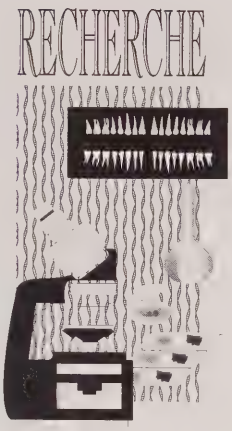

Évolution de l'édentation au Québec entre 1980 et 1993

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SOMMAIRE

Dans une population, le niveau d'édentation des adultes est un indicateur de leur santé dentaire. Ainsi l'évolution de ce phénomène permet d'appréhender les modifications du statut bucco-dentaire des adultes. En comparant les niveaux d'édentation au Québec entre 1980 et 1993, on trouve que le pourcentage des personnes de 18 ans et plus complètement édentées est passé de 26 à 20 p. cent et que le pourcentage des individus présentant une édentation sur un seul maxillaire a diminué de 18 à 13 p. cent. On note d'une part que cette diminution a été plus importante chez les jeunes adultes et chez les anglophones et d'autre part, que le revenu et l'éducation sont plus fortement associés à l'édentation en 1993 qu'ils ne l'étaient en 1980. Alors qu'en 1980, il y avait trois fois plus de personnes édentées sur au moins un maxillaire chez les individus avec un faible niveau de scolarité que chez les individus avec un niveau de scolarité élevé (73 p. cent versus 25 p. cent), en 1993, il y en a six fois plus (72 p. cent versus 12 p. cent). Il apparaît donc que la baisse du niveau d'édentation au Québec se traduit par une concentration plus forte des personnes édentées dans certains groupes à risque.

ABSTRACT

Level of edentation is a good indicator of a populations' bucco-dental health. Thus, the evolution of this phenomena enables us to seek any modification of adults' bucco-dental health. The percentage of adults in Quebec aged 18 and over who are completely edentulous decreased from 26 per cent in 1980 to 20 per cent in 1993. During the same period, the percentage of adults aged 18 and over who are only partially edentulous decreased from 18 per cent to 13 per cent. We note on one hand that this decrease is more prominent among younger adults and among anglophones and on the other hand that income and education are more strongly associated with edentulism in 1993 than in 1980. In 1980, individuals with lower levels of education were three times more edentulous (partially or totally) than those with higher levels of education (73 per cent versus 25 per cent). In 1993, this ratio increased to six times (72 per cent versus 12 per cent). It appears, therefore, that while edentulism has generally decreased in Quebec, it is more concentrated among certain high risk groups.

Introduction

L'amélioration du statut bucco-dentaire des enfants et des adolescents, dans les pays industrialisés, est relativement bien documentée. Par contre, le statut bucco-dentaire des adultes qui est aussi un phénomène changeant est beaucoup moins connu. Ces changements de statut dentaire ont une influence directe sur les besoins de traitements bucco-dentaires et donc sur le système de soins. Ainsi la connaissance des modifications du statut bucco-dentaire des adultes, pourrait permettre, entre autres, une meilleure planification des services dentaires.[1]

Pour mesurer la santé dentaire des adultes, le niveau de l'édentation complète dans la population est un indicateur fréquemment utilisé.[2,3] Ceci, d'une part, parce que la perte des dents est le résultat final des maladies bucco-dentaires et d'autre part parce que ce phénomène est relativement facile à mesurer.

Les précédentes études sur l'édentation au Québec montraient des taux d'édentation élevés. En 1977, Nutrition Canada publiait les résultats d'une enquête tenue durant les années 1970-72.[4] Les données indiquaient que le Québec avait un pourcentage d'adultes complètement édentés plus élevé que la moyenne nationale et que celui de plusieurs autres provinces. En 1980, à l'aide d'un sondage téléphonique auprès de 1 051 individus, Duquette a montré que 44 p. cent de la population québécoise âgée de 16 ans et plus était édentée au moins à un maxillaire (dont 25,7 p. cent sur les deux maxillaires).[5] Les résultats de cette étude montraient des taux d'édentation supérieurs à ceux de la plupart des pays industrialisés.

Plusieurs études ont mesuré la diminution de l'édentation dans les pays industrialisés. En Angleterre, le pourcentage de personnes de 18 ans et plus complètement édentées est passé de 37 à 20 p. cent entre 1968 et 1988.[6] En Suède, ce taux est passé, entre 1975 et 1981, de 15,4 à 11,4 p. cent[7] et aux États-Unis, on trouvait 13 p. cent des personnes complètement édentées en 1958, 11,2 p. cent en 1971 et 8,7 p. cent en 1983.[8] Cet article a pour but de décrire l'évolution de l'édentation chez les adultes au Québec en fonction des caractéristiques socio-démographiques de la population. Cette évolution sera étudiée en comparant les résultats de la présente étude réalisée en 1993 et de celle de Duquette réalisée en 1980.

Tableau I

Caractéristiques socio-démographiques des personnes de l'échantillon après pondération; (N = 8 042)

Variables	Catégories	Pourcentage
Âge	18-24 ans	12,3
	25-34 ans	23,9
	35-44 ans	21,5
	45-54 ans	15,4
	55-64 ans	12,3
	65 ans et plus	14,6
Sexe	homme	48,5
	femme	51,5
Éducation	six ans et moins	7,5
	sept à 12 ans	45,2
	13-15 ans	24,0
	16 ans et plus	23,3
Revenu	moins de 15 000 $	19,7
	15 000 à 24 999 $	16,3
	25 000 à 34 999 $	17,7
	35 000 à 54 999 $	22,4
	55 000 à 74 999 $	13,4
	75 000 $ et plus	10,5
Langue maternelle	français	81,0
	anglais	19,0

Méthodologie

Il s'agit d'un sondage réalisé par la firme SOM-R, entre le 29 octobre et le 14 décembre 1993, auprès d'un échantillon représentatif des quebécois âgés de 18 ans et plus et généré aléatoirement à partir de tous les échanges téléphoniques couvrant le territoire à l'étude. Cette procédure permet de prendre en compte les numéros confidentiels ou non publiés. L'échantillon a d'abord été sélectionné selon trois strates, avec 45 p. cent de l'échantillon provenant de la grande région de Montréal (indicatif 514), 30 p. cent provenant de la grande région de Québec (indicatif 418) et 25 p. cent d'ailleurs en province. Dans un deuxième temps, la sélection a consisté à choisir dans le ménage, de façon aléatoire, une personne âgée de 18 ans ou plus (procédure informatisée de sélection aléatoire simple sur l'âge).

Pour les analyses, les données ont été pondérées à trois niveaux : premièrement par rapport au nombre moyen de personnes de 18 ans ou plus par logement, deuxièmement par expansion à la distribution d'âge et de sexe de la population de chacune des strates au dernier recensement canadien et troisièmement selon les distributions en fonction de la langue maternelle de chacune des strates au même recensement.

Les questionnaires ont été administrés par téléphone avec assistance informatique. Jusqu'à cinq appels ont été faits pour tenter de rejoindre chacun des ménages. Le nombre total de participants est de 8 042, ce qui représente un taux de participation de 63,2 p. cent pour l'ensemble de la province.

Le questionnaire formulé en français et en anglais comportait 10 questions portant sur l'utilisa-

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Tableau II

Pourcentage des personnes de 18 ans et plus édentées sur au moins un maxillaire, en 1980 et en 1993, en fonction de leurs caractéristiques socio-démographiques

Caractéristiques socio-démographiques	p. cent édentées 1980	p. cent édentées 1993	Taux de variation entre les deux périodes (p. cent)
Femme	48	36	- 25
Homme	39	29	- 27
Taux de variation entre les deux catégories (p. cent)	- 19	- 19	—
Français	48	36	- 25
Anglais	32	18	- 44
Taux de variation entre les deux catégories (p. cent)	- 33	- 50	—
Scolarité la plus faible	73	72	- 1
Scolarité la plus élevée	25	12	- 52
Taux de variation entre les deux catégories (p. cent)	- 66	- 83	—
Revenu familial le plus faible	39	45	+15
Revenu familial le plus élevé	33	12	- 64
Taux de variation entre les deux catégories (p. cent)	- 15	- 73	—

tion des services dentaires, les assurances dentaires, l'édentation, le port de prothèses, l'hygiène dentaire, la satisfaction relative aux fonctions bucco-dentaires et la capacité de mastiquer certains aliments.

L'étude de Duquette a été réalisée en 1980, avec une méthodologie semblable. Un sondage téléphonique a été effectué à partir du tirage aléatoire des numéros de téléphone possiblement existant à travers la province de Québec. Le taux de participation pour ce sondage était de 73,1 p. cent. Au total, 1 051 personnes de 16 ans et plus ont été interrogées sur leur statut dentaire et leurs habitudes de soins dentaires. L'échantillon a ensuite été pondéré pour qu'il soit représentatif de la population québécoise.

Résultats

Le **tableau I** montre la distribution des sujets de l'échantillon selon les différentes strates des variables socio-démographiques retenues pour l'étude. Les données étant pondérées, il s'agit d'un portrait représentatif de la population québécoise âgée de 18 ans et plus lors du dernier recensement canadien.

Édentation

En 1993, les personnes complètement édentées représentent 20 p. cent de la population de 18 ans et plus au Québec. De plus 13 p. cent des individus présentent une édentation sur un seul maxillaire (12 p. cent au maxillaire supérieur et 1 p. cent au maxillaire inférieur). L'amélioration par rapport à l'étude de 1980 est notable puisque à cette époque 26 p. cent des personnes étaient complètement édentées et 18 p. cent édentées sur un seul maxillaire.

Édentation complète en fonction de l'âge

L'âge est bien évidemment très associé à l'édentation complète. En 1993, seulement 1 p. cent des personnes de 18 à 24 ans sont complètement édentées. Ce taux passe à 4 p. cent pour les personnes de 25 à 34 ans, 14 p. cent pour les personnes de 35 à 44 ans, 22 p. cent pour les personnes de 45 à 54 ans, 37 p. cent pour les personnes de 55 à 64 ans et enfin à 58 p. cent pour les personnes de 65 ans et plus.

Si on compare ces résultats avec ceux de Duquette (**Fig. 1**), on remarque que le taux d'édentation pour chaque groupe d'âge est équivalent au taux d'édentation trouvé en 1980 pour les personnes du groupe d'âge précédent. Par exemple, en 1993, 14 p. cent des personnes de 35 à 44 ans sont complètement édentées. Or en 1980, Duquette trouve le même pourcentage d'édentés complet chez les personnes de 25 à 34 ans. On peut noter qu'il y a 13 années d'écart entre les deux études. Ainsi, les personnes qui ont 35 à 44 ans en 1993 avaient, en 1980, un taux d'édentation complète légèrement inférieur à celui des personnes alors âgées de 25 à 34 ans (14 p. cent). Ceci permet de

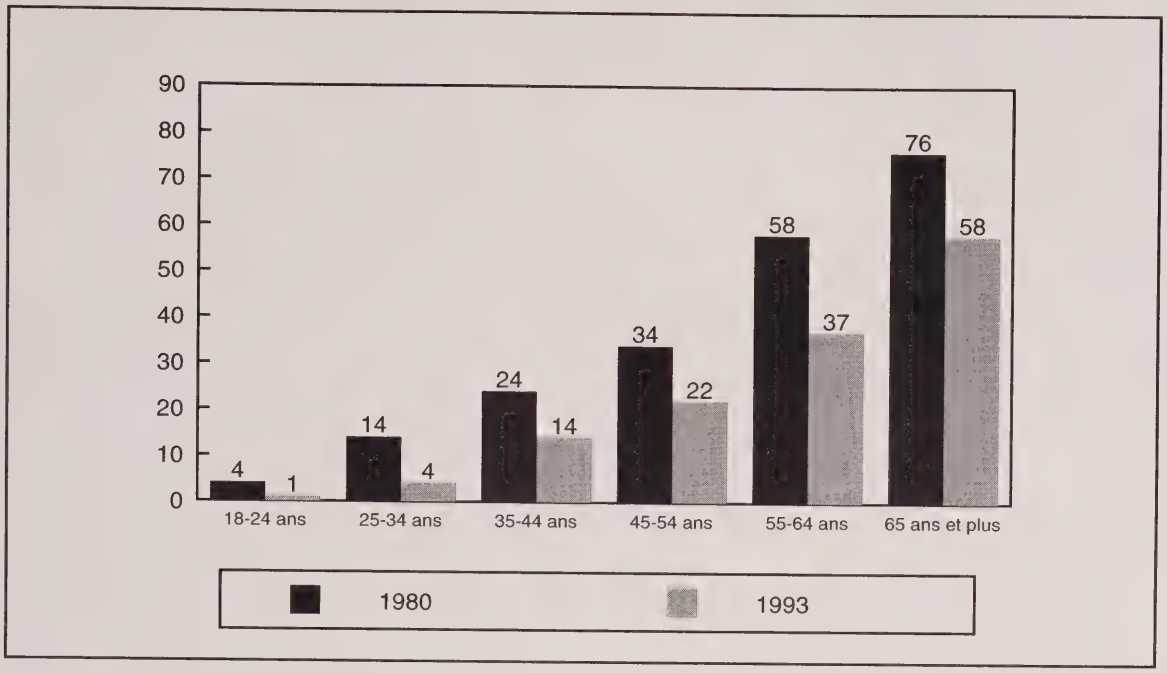

Fig. 1 : Pourcentage des personnes complètement édentées en 1980 et en 1993, en fonction de l'âge.

conclure qu'il s'est produit quelques nouveaux cas d'édentation complète au Québec, entre 1980 et 1993, mais que cette incidence est faible.

D'autre part, la diminution du pourcentage de personnes complètement édentées a été plus rapide chez les jeunes adultes. Pour les personnes de 18 à 34 ans on obtient un taux de variation de plus de 70 p. cent puis ce taux passe à 42 p. cent pour les personnes de 35 à 44 ans, 35 p. cent pour les personnes de 45 à 64 ans et 24 p. cent pour les personnes de 65 ans et plus.

Édentation sur au moins un maxillaire, chez les personnes de 18 ans et plus, en fonction de leurs caractéristiques socio-démographiques

Pour des raisons de comparaison avec l'étude de 1980, nous utiliserons ici le pourcentage de personnes édentées sur au moins un maxillaire et non pas seulement le pourcentage de personnes complètement édentées. Le **tableau II** indique les pourcentages des personnes édentées sur au moins un maxillaire en fonction de leurs caractéristiques socio-démographiques pour les années 1980 et 1993. La comparaison entre ces deux études, montre que l'importante amélioration du statut dentaire des adultes au Québec n'a pas effacé les inégalités qui existaient entre les différents groupes socio-économiques et ethniques et entre les hommes et les femmes.

Pour les hommes et les femmes, entre 1980 et 1993, on obtient une diminution du pourcentage de personnes avec au moins un maxillaire édenté à peu près semblable (27 p. cent et 25 p. cent). Ce qui fait que la différence qui existait en 1980 entre les hommes et les femmes se retrouve en 1993. Chez les femmes, il y a 19 p. cent en plus de personnes avec au moins un maxillaire édenté que chez les hommes (36 p. cent versus 29 p. cent en 1993).

D'autre part, entre 1980 et 1993, on note une amélioration, concernant l'édentation, beaucoup plus importante chez les anglophones que chez les francophones, avec une diminution du pourcentage de personnes avec au moins un maxillaire édenté de 44 p. cent chez les anglophones, mais seulement de 25 p. cent chez les francophones.

C'est au niveau de l'éducation et du revenu que les résultats sont les plus spectaculaires. Concernant les personnes avec le plus faible niveau d'éducation, il n'y a aucune amélioration entre 1980 et 1993. On retrouve, pour ces deux années, environ le même pourcentage de personnes avec au moins un maxillaire édenté (73 p. cent et 72 p. cent). Par contre, chez les personnes avec le plus haut niveau d'éducation, il y a en 1993 deux fois moins de personnes avec au moins un maxillaire édenté qu'en 1980 (12 p. cent et 25 p. cent).

En comparant les personnes avec un revenu inférieur à 15 000 $ par an en 1980 avec les personnes ayant un revenu inférieur à 25 000 $ par an en 1993 (ce qui correspond à un peu plus du tiers des personnes dans les deux études), on trouve 39 p. cent d'individus avec au moins un maxillaire édenté en 1980 et 45 p. cent en 1993. Il y a donc eu dans ce groupe une augmentation du pourcentage de personnes édentées entre 1980 et 1993. Par contre chez les personnes avec le revenu le plus élevé (10 à 15 p. cent de la population dans les deux études) il y avait, en 1980, 33 p. cent de personnes édentées sur au moins un maxillaire contre seulement 12 p. cent en 1993, soit une amélioration de 64 p. cent.

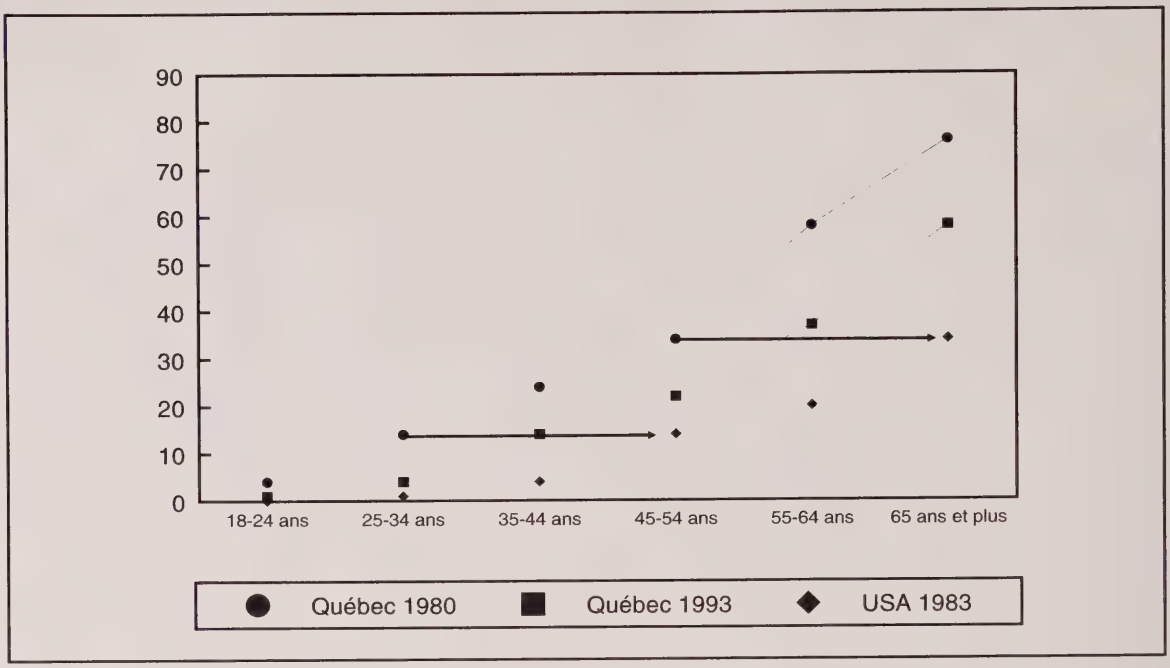

Fig. 2 : *Pourcentage des personnes complètement édentées au Québec, entre 1980 et 1993, et aux États-Unis en 1983, en fonction de l'âge.*

Comparaison de l'édentation complète entre le Québec et les États-Unis

L'évolution de l'édentation complète au Québec entre 1980 et 1993 montre que l'incidence de ce phénomène est faible. Ceci permet d'en prédire l'évolution. En effet, si l'incidence de l'édentation reste au même niveau, on retrouverait dans 13 ans un taux d'édentation pour un groupe d'âge (ex. : 45-54 ans) équivalent à celui des personnes du groupe d'âge inférieur en 1993 (ex. : 35-44 ans). Lorsque l'on compare les taux d'édentation complète au Québec, en fonction de l'âge, avec ceux des États-Unis,[8] on remarque que la différence observée entre 1980 et 1993 au Québec est la même que celle qui existe entre les taux du Québec en 1993 et ceux des États-Unis en 1983 (**Fig. 2**). Il semble donc que les taux d'édentation complète au Québec tendent vers ceux des États-Unis et que dans quelques 10 années, la courbe de l'édentation en fonction de l'âge au Québec, ressemblera à celle des États-Unis en 1983.

Discussion

Les adultes au Québec, comme dans de nombreux pays industrialisés, ont connu une amélioration importante de leur statut bucco-dentaire avec, entre autres, une diminution notable du pourcentage de personnes édentées.[9,10] Les raisons de cette baisse sont multiples. La meilleure accessibilité aux services dentaires, tant au niveau géographique qu'au niveau économique a permis de diminuer les actes d'urgence et d'extractions en faveur d'actes de prévention ou de restauration,[11] modifiant ainsi le profil d'utilisation des services dentaires et les habitudes des intervenants. D'autre part, l'attitude des personnes concernant leur santé dentaire est un facteur particulièrement important.[12,13] La prise de conscience de l'importance de la santé dentaire, en particulier chez les jeunes adultes, a entraîné cette amélioration rapide de leur statut bucco-dentaire. On peut noter que la première cohorte d'enfants de six ans et moins, couverts en 1974 par le nouveau régime étatique de soins dentaires, est composée en 1993 de jeunes adultes de 19 à 25 ans.

Il reste que le Québec, malgré cette importante diminution, possède un taux d'édentation complète deux fois plus élevé que celui des États-Unis ou de la Suède. Mais il est probable que la baisse du niveau d'édentation va se poursuivre au Québec à un rythme rapide. Pour les jeunes adultes on peut espérer obtenir, dans quelques années, des taux d'édentation pratiquement nuls. Par contre pour les personnes plus âgées les taux d'édentation vont rester relativement élevés pendant un certain temps, car d'une part ils sont déjà importants et d'autre part, ils diminuent moins rapidement que chez les jeunes adultes.[14]

Les conséquences de ces changement sont nombreuses. De plus en plus l'édentation va tendre à disparaître chez les jeunes adultes et se concentrer chez les personnes plus âgées. D'autre part, les adultes, y compris les personnes âgées, vont conserver un plus grand nombre de dents et, qui plus est, pendant une période de temps plus longue. Ce changement de statut bucco-dentaire va donc entraîner de nouveaux be-

soins en soins conservateurs et ainsi modifier la demande et l'utilisation des services dentaires.

La comparaison de ces deux études sur l'édentation au Québec montre qu'entre 1980 et 1993, malgré une importante diminution de ce problème, l'inégalité entre les hommes et les femmes n'a pas disparu. Cette inégalité se retrouve dans la plupart des pays industrialisés.[15] Ce phénomène ne s'explique pas seulement par le fait que les femmes soient plus âgées que les hommes car on retrouve cette différence dans toutes les classes d'âge. Il est à noter que même en contrôlant les niveaux d'éducation et de revenu les femmes présentent plus de risques d'être édentées que les hommes. Une autre hypothèse à vérifier, serait qu'il existe une plus grande proportion d'hommes que de femmes avec un nombre très restreint de dents, les femmes préférant plus souvent faire extraire leurs dernières dents pour porter des prothèses complètes. Mais il reste que cette différence entre les hommes et les femmes est relativement importante (36 p. cent de personnes édentées sur au moins un maxillaire chez les femmes versus 29 p. cent chez les hommes).

Le fait que la diminution du niveau d'édentation ait été plus rapide chez les anglophones que chez les francophones indique que le changement des attitudes vis-à-vis de la santé dentaire a été plus important chez les anglophones. En 1993, le pourcentage des personnes complètement édentées chez les anglophones du Québec est semblable à celui des États-Unis, alors que chez les francophones, ce taux est deux fois plus élevé.[9]

Une autre conséquence importante à prévoir, à partir de l'évolution du niveau d'édentation observée entre 1980 et 1993 au Québec, est que si on ne fait rien pour diminuer les inégalités sociales par rapport à ce problème, l'édentation risque d'être un handicap expérimenté presqu'exclusivement par les populations les plus défavorisées. C'est déjà ce qui se passe en Suède, où une étude a montré que le risque d'être édenté, chez les cadres avec un haut niveau d'éducation, est pratiquement nul quel que soit l'âge, alors que chez les ouvriers avec un faible niveau d'éducation ce risque varie entre 25 et 60 p. cent selon l'âge.[7] Au Québec, on peut noter que le revenu et surtout le niveau d'éducation sont plus fortement associés à l'édentation en 1993 qu'ils ne l'étaient en 1980. Alors qu'en 1980, il y avait trois fois plus de personnes édentées sur au moins un maxillaire dans le groupe avec le plus faible niveau de scolarité que dans le groupe avec le plus haut niveau de scolarité (73 p. cent versus 25 p. cent), en 1993 il y en a six fois plus (72 p. cent versus 12 p. cent).

Conclusion

La baisse importante de l'édentation au Québec, entre 1980 et 1993, est un phénomène très encourageant qui montre que les progrès enregistrés au niveau de la santé dentaire des enfants se retrouvent également chez les adultes.

La principale conclusion que l'on peut tirer de la comparaison entre le niveau d'édentation au Québec en 1980 et celui de 1993 est qu'il existe aujourd'hui des groupes qui sont beaucoup plus à risque d'être édentés, en particulier les personnes avec un faible niveau de scolarité et celles avec un faible revenu. C'est chez ces personnes qu'il faudra intervenir pour que la baisse du pourcentage de personnes édentées se poursuive, au Québec. ■

Remerciements : Cette étude a été rendu possible grâce aux subventions obtenues du Fonds de la recherche en santé du Québec, de la Direction générale de la santé publique du Ministère de la santé et des services sociaux du Québec ainsi que de l'Ordre des dentistes du Québec. Nous remercions également la firme SOM-R qui a administré les questionnaires ainsi que le département de médecine préventive de l'Hôpital St-Luc et la Direction de la santé publique de la Régie régionale de Montréal-Centre pour leur support dans la réalisation de cette étude.

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Money Market	✔ **7.2%**	6.2%	✔ **5.7%**	5.0%	✔ **6.6%**	6.1%	✔ **8.3%**	7.9%
International Equity	✔ **12.0%**	9.2%	n/a		n/a		n/a	
European	✔ **16.6%**	11.6%	n/a		n/a		n/a	
Pacific Basin	✔ **11.2%**	-2.3%	n/a		n/a		n/a	
Emerging Markets	✔ **-4.6%**	-10.1%	n/a		n/a		n/a	

† *CDA figures indicate annual compound rate of return with all fees deducted. The figures are historic rates based on past performance and are not necessarily indicative of future performance.*

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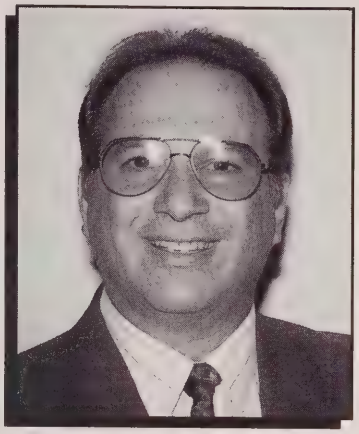

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Did you fabricate a complete set of dentures for a patient in your office today — this week, this month? Were you completely satisfied with the denture care you provided for your patient? Was your patient completely satisfied with the prosthetic treatment he or she received from you and your staff?

It will probably come as no surprise that there are dentists who would prefer not to provide a denture service — just as there are dentists who would prefer not to treat children, or do endodontics or surgical extractions, or any one of the multitude of dental disciplines. This freedom to choose the procedures we will do — the ones we like to do, and do best — is what makes our profession unique. It is what brings us a sense of satisfaction and fulfilment at the end of the day.

But dentures, by their very nature, fall into a different category. Patients are able to choose whether they want to be treated by a professionally trained dentist or a denturist. In fact, they are being encouraged, enticed and exhorted to attend the denturist. And that is where the risk factor lies.

The history of denturism in Canada goes back more than 40 years. Today, nine of the 10 provinces (P.E.I. is the exception) have some provision for non-dentists providing a denture service directly to the public. Educational requirements and the scope of practice varies from province to province, as does the name — denturist, denturologist, dental mechanic, denture therapist. But whatever the provincial legislation or the name, the result is the same. Denturists are providing thousands and thousands of full and partial dentures to the Canadian public every year. They are also becoming increasingly aggressive with respect to the expansion of both their services and their scope of practice — wanting to expand into areas for which they are neither skilled nor trained.

Things are different than they were in the 1950s — much different. For one thing, patients are living longer. They often present with many of the oral manifestations and medical complications that are associated with the aging process — these conditions demand the diagnostic skills and acumen that only a dentist can provide. Treatment modalities such as ridge augmentation, implants and precision attachments have reached a stage of sophistication that require skills far beyond those that a community college course or apprenticeship can provide. If you introduce a third ingredient to this equation — the current decline in edentualism — you can further appreciate the denturists' increasing aggressiveness and, therefore, the patient's potential for risk.

Dentists across the land must address this growing problem now and do everything possible to reduce patient risk. In denture fabrication, as in every other discipline, it is the dentist's responsibility to provide the best possible service for his or her patient. It is a sad day when a dentist with years of training and experience cannot make a better denture than a community college graduate. But if a dentist chooses not to provide a removable denture service — and that's his or her choice — then surely there is an obligation to refer the patient to someone who can competently do so. It is also a sad day when some oral and maxillofacial surgeons and periodontists place implants, do ridge augmentations and other surgical treatment according to a denturist's referral. These treatments — all complicated in their own right — require a full professional examination, diagnosis and treatment plan. They particularly demand dialogue between those who perform the surgical treatment and those who provide sophisticated superstructures.

It is time to take back our profession. We do not wish to initiate a turf war. In a war, no one wins everything and everyone loses something. Our paramount obligation is to protect the public and provide the best prosthodontic services possible. This can be achieved by — at the very least — curtailing the denturists' ambitions to expand their scope of practice. This requires education.

It will mean educating and re-educating the legislators and the public. We need to get the message across that there is a difference between the treatment provided by dentists and that provided by denturists. It also requires that dentists understand that dentures are still an important treatment mode for thousands of patients. Indeed, with the steady increase in implantology and surgical interventions, developing a functioning superstructure is more complex than ever.

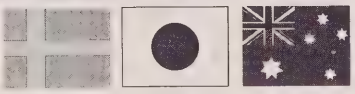
To this end, the Association of Prosthodontists of Canada (APC) is committed to cooperate to the fullest. When called upon, APC members will provide guidance and information, and will be pleased to conduct hands-on training for general dentists in the area of denture and implant-related prosthodontics. APC believes that every community in Canada should have a list of dentists who are willing to provide denture services for the public.

APC is very pleased that the Canadian Dental Association has taken steps to establish a means of promoting dentist-provided prosthodontic services through public awareness, professional awareness and legislative awareness. The input of dentists is vital to meet these objectives. Interested readers may contact either Mr. Brian Henderson at the Canadian Dental Association in Ottawa, or the APC president at (416) 499-1704, or fax (416) 499-1751.

Today, let us work together to provide the best possible denture service to the people we owe the most, our patients.

Dr. Rubinoff conducts a private prosthodontic practice in Willowdale, Ontario, and is president of the Association of Prosthodontists of Canada.

INTERNATIONAL



March 23-30

37th International Alpine Dental Conference in Courchevel, France. Lecturers: Dr. Oded Bahat and Prof. Birte Melson. Contact the International Dental Foundation, 53 Sloane St., London SW1X 9SW, U.K. Tel.: 00 44 (0) 171 235-0788, or fax: 00 44 (0) 171 235-0767.

May 5-8

Fifth Congress Of The International Society for Lasers In Dentistry in Jerusalem, Israel. Contact: ISLD, P.O. Box 50006, Tel Aviv, 61500, Israel. Tel.: 972 3 5140000, or fax: 972 3 5174674 or 972 3 5140077.

June 18-22

Turkish Dental Association's 3rd International Dental Congress in Ankara, Turkey. Tel: 0 312 479 8924, or fax: 0 312 474 79 25.

July 11-13

International Women's Dental Conference in Melbourne, Australia. "Enhancing the balance both personally and professionally." Contact Amanda Lawrence, 3 Railway Walk, Hampton 31188, Australia. Tel.: (03) 9521 6500, or fax: (03) 9521 6501.

August 19-23

21st North Queensland Dental Convention in Cairns, Australia. Contact Peter Martin, North Queensland Dental Convention, P.O. Box 388, Cairns 4870, Australia. Tel.: (070) 51 2351, or fax: (070) 31 2351.

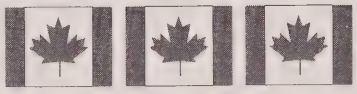
September 4-8

18th Biennial Conference of the New Zealand Dental Association — Tomorrow's Dentistry Today in Rotorua, New Zealand. Contact the NZDA Conference Secretary, Dr. Roger Ayers, 19 Pukaki St., Rotorua, New Zealand. Tel.: +64 7 348 5385, or fax: +64 7 348 6788.

October 5-8

International Conference on Stress and Health — ISMS 6 in Sydney, Australia. Contact F.J. McGuigan, Institute for Stress Management, 10455 Pomerado Rd., San Diego, Calif. 92131. Tel.: (619) 635-4698, or fax: (619) 635-4669. Internet: NOSTRESS@sanac.USIU.edu.

CANADA



March 2

X-ray X-cellence. Presenters: Dr. Barry Pass and Dr. Tom Blackmore. Contact Continuing Education, Faculty of Dentistry, Dalhousie University, Halifax, N.S. B3H 3J5. Tel.: (902) 494-1674, or fax: (902) 494-2527.

March 2 — Part I
September 28 — Part II
March 1, 1997 — Part III

Mini-Residency in Periodontics. Presented by the Manitoba Society of Periodontists. Contact Darcy Duggan. Tel.: (204) 789-7331, or fax: (204) 888-4113.

March 2-4

Fifth Annual Whistler Resort Dental Seminar. Hosted by the Vancouver Chapter of Alpha Omega Fraternity. Contact Beverly Corber, 6738 Montgomery St., Vancouver, B.C. V6P 4G4. Tel.: (604) 266-2454, or fax: (604) 266-7335.

March 11-15

British Columbia Academy of General Dentistry's **Ski & Continuing Education Conference** in Whistler, B.C. Contact the AGD, B.C. Chapter 206, 5722-176 A St. Surrey, B.C. V3S 6H5. Tel.: 1-800-933-1339.

March 13-15

1996 Western Canada Dental Bonspiel in Calgary. Contact Dr. Joey H. Brown, suite 211, 1632 14th Ave. N.W., Calgary, Alta. T2N 1M7. Tel.: (403) 289-7370, or fax: (403) 289-6830.

March 23

Oral Pathology: Selected Controversies. Presenter: Dr. Thomas Daily. Contact Continuing Education, Faculty of Dentistry, Dalhousie University, Halifax, N.S. B3H 3J5. Tel.: (902) 494-1674, or fax: (902) 494-2527.

March 29-30

Southern Ontario Surgical Orthodontic Study Group will meet in Windsor, Ont. Contact Dr. Jeff Berger. Tel.: (519) 258-2632, or fax: (519) 258-2637.

April 16

Review of Analgesics in Dentistry. Presenter: Dr. W.C. Foong. Contact Continuing Education, Faculty of Dentistry, Dalhousie University, Halifax, N.S. B3H 3J5. Tel.: (902) 494-1674, or fax: (902) 494-2527.

April 18

Emergency Procedures In The Dental Practice — Dr. Earle Young. Contact Continuing Dental Education, Faculty of Dentistry, University of Toronto. Tel.: (416) 979-4902, ext. 4503 or 4590, or fax: (416) 979-4941.

April 22

The George C. Hare Lecture in Endodontics. Guest speaker: Dr. Gunnar Bergenholtz from Goteborg, Sweden. Registration will be limited to the first 120 persons. Contact Continuing Dental Education, Faculty of Dentistry, University of Toronto. Tel.: (416) 979-4902 ext.: 4503, or 4590, or fax (416) 979-4941.

April 27

Review and Update in Medicine. Contact Continuing Education, Faculty of Dentistry, Dalhousie University, Halifax, N.S. B3H 3J5. Tel.: (902) 494-1674, or fax: (902) 494-2527.

April 27

Innovations In Clinical Dentistry: New Directions For the 21st Century — Howard Strassler, DMD. Contact Darcy Duggan, University of Manitoba. Tel.: (204) 789-7331, or fax (204) 888-4113.

May 2

The University of Toronto Class of 1986 — 10-year reunion. Contact Dr. Iris Kivity-Chandler. Tel.: (416) 787-9060, or fax: (416) 709-3905.

May 4

An Overview of Forensic Dentistry. Presenter: Dr. David Sweet. Contact Continuing Education, Faculty of Dentistry, Dalhousie University, Halifax, N.S. B3H 3J5. Tel.: (902) 494-1674, or fax: (902) 494-2527.

May 10-11

Joint meeting of the **Canadian Academy of Periodontology (CAP)** and the **Association of Prosthodontists of Canada (APC)** in Montreal, Que. Contact Dr. Don Kramer (APC), tel.: (416) 597-0839; or Dr. Lorne Wiseman (CAP), tel.: (514) 937-3535.

May 11

Northern Alberta Dental Hygienists Society in Edmonton — Emergency Medicine in Dentistry. Guest speaker: Dr. Stanley Malamed. Contact Glennis or Patricia McIntyre. Tel.: (403) 465-1756, or fax: (403) 440-0554.

May 11

Pediatric Dentistry, 1996: A Renaissance. Presenter: Dr. Theodore Croll. Contact Continuing Education, Faculty of Dentistry, Dalhousie University, Halifax, N.S. B3H 3J5. Tel.: (902) 494-1674, or fax: (902) 494-2527.

June 7-9

Canadian Dental Hygienists' Association 7th Annual Professional Conference — "Interdependence and Independence: Striking a Balance." Contact Janice Edgar. Tel.: (613) 221-5515, or fax: (613) 224-7283.

July 6

HIV Prevention Works — a satellite symposium of the XI International Conference on AIDS in Vancouver, B.C. Contact the Canadian Public Health Association, 400-1565 Carling Ave., Ottawa, Ont. K1Z 8R1. Tel.: (613) 725-3769, or fax: (613) 725-9826.

July 23-26

Eighth International Congress of the International Association of Oral Pathologists in Toronto. Contact the Congress Office, P.O. Box 1570, 190 Railway St., Kingston, Ont. K6L 5C8.

August 17-20

Canadian Dental Association 1996 Convention in Montreal. Scientific sessions, exhibit hall, social events, special activities, spouse's program and children's program. Contact Laura Stephenson. Tel.: (613) 523-1770, ext. 246, 1-800-267-6354, or fax: (613) 523-3062.

August 17-22

Eighth World Congress on Pain in Vancouver, B.C. Sponsored by the International Association for the Study for Pain (IASP). Contact the IASP Secretariat, 909 N.E. 43rd St., Suite 306, Seattle, Wash. 98105, U.S.A. Tel.: (206) 547-6409, or fax: (206) 547-1703.

November 1-2

Southern Ontario Surgical Orthodontic Study Group will meet in Windsor. Contact Dr. Jeff Berger. Tel: (519) 258-2632, or fax: (519) 258-2637.

U.S.A.

March 2-3

The 1996 Moyers Symposium — Creating the Compliant Patient — in Ann Arbor, Michigan. Sponsored by the School of Dentistry and The Center for Human Growth and Development. Contact the Office of Continuing Education, School of Dentistry, The University of Michigan, Ann Arbor, Mich. 48109-1078. Tel.: (313) 763-5070, or fax: (313) 936-3065.

April 14-16

Minnesota Dental Association's 113th Star of the North Meeting. Contact the Minnesota Dental Association, 2236 Marshall Ave., St. Paul, Minn. 55104. Tel.: (612) 646-7454, or fax: (612) 646-8246.

May 3-4

15th Annual Academy for Sports Dentistry Symposium in Minneapolis, Minnesota. Featuring orofacial trauma and hands-on mouthguard fabrication workshop. Contact the University of Minnesota, Continuing Dental Education, 6-506 Moos HS Tower, 515 Delaware St. S.E., Minneapolis, Minn. 55455. Tel.: (612) 625-1418.

June 13-16

1996 Annual Symposium of the Office Sterilization and Asepsis Procedures (OSAO) Research Foundation in Dallas, Texas. Contact the OSAP Central Office, P.O. Box 6297, Annapolis, Md. 21401. Tel.: (410) 798-5665 or 1-800-298-6727, or fax: (410) 798-6797.

July 25-27

10th National Conference on the Young Dentist — A Decade of Excellence, in Cleveland, Ohio. Contact the American Dental Association Committee on the New Dentist. Tel.: (312) 440-2779.

DENTAL MEETINGS

March 14-16

British Columbia Dental Meeting in Vancouver. Contact Marilynne Webster. Tel.: (604) 736-3645.

March 29-30

Interim Meeting of the CDA Board of Governors in Ottawa. Contact Suzanne Burton. Tel.: (613) 523-1770, ext. 201, or 1-800-267-6354.

May 2-4

Ontario Dental Association Annual Spring Meeting in Toronto. Contact Diana Thorneycroft. Tel.: (416) 922-3900, ext. 346, or fax: (416) 922-9005.

May 9-11

Newfoundland Dental Association Annual Meeting in Cornerbrook. Tel.: (709) 579-2362.

May 23-25

Prince Edward Island Dental Association Annual Meeting in Mill River. Contact Dr. Cheryl Wenn. Tel.: (902) 628-8088.

May 25-29

25e Congrès annuel de l'Ordre des dentistes du Québec — Les Journées dentaires in Montreal. Contact Nicole Pagé or Ginette Boutin. Tel.: (514) 875-8511, or fax: (514) 875-1561.

May 31-June 1

New Brunswick Dental Society Annual Meeting in St. Andrews. Tel.: (506) 452-8578.

June 6-9

Alberta Dental Association Annual Meeting and Convention in Kananaskis. Tel.: (403) 432-1012.

June 14, 15

Nova Scotia Dental Association Annual Meeting in Baddeck. Contact Steve Jennex. Tel.: (902) 420-0088.

August 17-20

Annual Meeting of the CDA Board of Governors, in Montreal. Contact Suzanne Burton. Tel. (613) 523-1770, ext. 201, or 1-800-267-6354.

August 17-20

CDA 1996 Convention in Montreal. Contact Laura Stephenson. Tel.: (613) 523-1770, ext. 246, or 1-800-267-6354, or fax (613) 523-3062.

Notices of meetings and continuing education courses are published without charge for appropriate **not-for-profit** dental organizations, teaching facilities or recognized study clubs. Information must be received two months prior to expected publication date, and will be published at the discretion of the editor. Send all requests c/o Ms. Rachel Galipeau, *Journal* editorial assistant, Canadian Dental Association, 1815 Alta Vista Dr., Ottawa, Ont. K1G 3Y6.

Be Immortal

If you could look into the eyes of generations yet to come, you would be there.

Because immortality lies not in the things you leave behind, but in the people that your life has touched, for good or bad.

By including the Canadian Cancer Society in your will, you can have a powerful effect on those who come after you.

You see, cancer can be beaten. The survival rate for cancer patients is already over 50% in Canada.

You'll be leaving behind a legacy of life for others. And that is a beautiful way of living forever yourself.

If you or your lawyer want to know more about the Society and what we do, telephone or write the Canadian Cancer Society.

This message has been reproduced with the kind permission of the American Cancer Society and this space is contributed as a public service.

CANADIAN CANCER SOCIETY | SOCIÉTÉ CANADIENNE DU CANCER

If you're not a CDA member, here's what you missed in the November/December issue of Communiqué ...

CDA Appears Before Finance Committee

Health Canada Releases Report on Mercury Exposure

Dental Benefits Issues Committee Develops Action Plan

Managed Care — What Does It Really Mean?

Competition In Dentistry: Where Will It All End?

CDA members receive ***Communiqué,*** in the language of their choice, six times per year as a benefit of membership. For more information, or to join your national association, call: 1 (800) 267-6354.

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See next page for more details...

Taking Care of Business is an essential resource for every dentist!

Over two years in development by the Canadian Dental Association in partnership with ExperDent Consultants, ***Taking Care of Business*** is the most extensive project in practice management that the CDA has ever undertaken. We went to the experts in Canadian dental practice management to bring you the most up-to-date and thorough practice management materials available anywhere in North America!

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- Why practice value is important
- Understanding your practice's potential
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- Examining your break even point
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- Setting realistic goals for practice growth
- Marketing & growth strategies
- Scheduling & appointing strategies
- Introduction to practice transitions

Volume 2 • Associate and Transition Planning

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- Transition choices for new dentists
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- Factors in sale/purchase transactions
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- How to evaluate the options
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Offices & Practices

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BRITISH COLUMBIA: Orthodontist seeks practice opportunity starting July 1996. Prefers Lower Mainland or Vancouver Island. Willing to associate leading to partnership or purchase. Please call (716) 427-2708. (01/03)

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BRITISH COLUMBIA - Kelowna: Modern, well-equipped four op dental office in beautiful Okanagan Valley seeks specialist to lease space three days per week. Would also suit G.P. with existing patient load who wants to work a compressed work week or part time. Great way to lower your overhead and have more personal/recreation time in a desirable area! Phone (604) 765-3532 evenings. (12/02)

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BRITISH COLUMBIA
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(604) 682-7561. (11/02)

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SASKATCHEWAN - Central Region: Dental practice for sale or lease in this rural Saskatchewan community of about 3,000 people. Owner is taking a year's sabbatical to return to school. Three operatories, with more than adequate remuneration, but will sell if "the price is right." Reply to CDA ACCESS Box #2689. (09/03)

ONTARIO - Thunder Bay: Established family practice for sale. Modern four operatory practice, high grossing, hygiene driven, eight to nine days of hygiene per week. Dentist returning to school for postgraduate specialty.Phone (807) 344-3286 after 5:00 p.m. (01/03)

ONTARIO - Fort Francis: Busy dental practice for sale, three operatories, fully modern equipment, low overhead, 90% insurance, grossing about $600,000. Excellent staff with full-time hygienist, ideal for outdoor enthusiast. Call (807) 274-7131. (01/03)

NOVA SCOTIA- Halifax/ Dartmouth: Established general practice for sale in busy commercial park. Modern, computerized office, solid recall program. Please reply to CDA ACCESS Box# 2695. (01/02)

Positions Available/Sought

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NORTHWEST TERRITORIES - Yellowknife: Associate required for a modern family dental practice with a pleasant support staff. The clinic is located in the city of Yellowknife, N.W.T. (population 15,000). We are seeking a caring, motivated

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Clark Dental Services Ltd., a general dentistry practice located in Inuvik, Northwest Territories, will be seeking quality-conscious dentists to begin associateships with the clinic over the next 24 months. Associate opportunities may exist in the form of rotating relief work in Inuvik, or as a travelling dentist working with mobile Dental Teams serving remote Western Arctic Inuvaluit and Dene settlements. If you are interested in practising superior quality general dentistry with a clinic located above the Arctic Circle, please forward your resume and a covering letter to:

Dr. Dean Gould at Box 1360
Inuvik, NWT, X0E 0T0.

Canadian Licenced Dentists are invited to apply. (08/02)

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BRITISH COLUMBIA - Victoria: Experienced and motivated associate required, full time, for buy-in within one year. A very busy practice with a large pleasant office located in a beautiful city. Call Dr. A. Van Hoek, (604) 361-9887 or (604) 727-2591 after 5 p.m. (01/02)

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University of Alberta
Edmonton

Department of Oral Health Sciences
Four Tenure Track Positions

The University of Alberta, Department of Oral Health Sciences, Faculty of Medicine and Oral Health Sciences, invites applications for four tenure track positions in the areas of (1) oral microbiology, (2) anatomy (head and neck focused), (3) oral epidemiology, and (4) biomaterials. Preferences will be given to candidates who have demonstrated potential for or who have achieved a successful research career. Candidates will be expected to apply for research salary support funding from an external agency as part of the selections process. Appointment will be made in the appropriate department within the Faculty of Medicine and Oral Health Sciences. The person must hold an PhD or equivalent degree and a DDS, DMD, or MD degree(s). Candidates should forward their *curriculum vitae*, outlines of their research interests, and names of three references to:

Dr. G. Wayne Raborn, Associate Dean
3036 Dentistry Pharmacy Centre
University of Alberta, Edmonton, AB T6G 2N8

Closing date is March 1, 1996. Starting date is flexible but is targeted as July 1, 1996.

The University of Alberta is committed to the principle of equity in employment. As an employer we welcome diversity in the workplace and encourage applications from all qualified women and men, including Aboriginal peoples, persons with disabilities, and members of visible minorities.

Alberta Children's Hospital

Director, Department of Pediatric Dentistry

The Acute Care Sector of the Calgary Regional Health Authority invites applications for a full-time position as Director, Department of Pediatric Dentistry at the Alberta Children's Hospital.

Requirements include a DDS/DMD degree or NDEB of Canada equivalency, plus certification or board eligibility in pediatric dentistry and a commitment to hospital-based practice. Recent graduates are encouraged to apply.

The goal of this position is to develop a multi-disciplinary Family Pediatric Dental Care Program with special emphasis in providing clinical patient care to the mentally and physcially challenged and medically compromised pediatric population of Southern Alberta. Some administrative responsibilities will be required with research and teaching opportunities also available.

The Alberta Children's Hospital is at the forefront of the challenging field of health care reform occurring in Alberta.

Salary will be commensurate with experience and training. Interested candidates are encouraged to submit a complete resume to:

ALBERTA CHILDREN'S HOSPITAL
Pediatric Dentistry, Director - Search Team
c/o Dr. Trey L. Petty, Foothills Hospital, 1403 - 29 Street N.W.
Calgary, Alberta T2N 2T9
Tel: (403) 670-2401 Fax: (403) 670-2483

ALBERTA - Calgary: Dentist required. Long-established group practice, preventive-oriented, central location, extended hours, emergency service, eight operatories, 4,000 sq. ft. Immediate openings. Share expenses with option to purchase. Contact Program Controller: Parkdale Dental Group, Phone (403) 283-5596, Fax (403) 283-5597. (01/03)

ALBERTA - Fort McMurray: Long-term associate required to begin on or around July 15, 1996. Population 35,000. High brows to harleys. Tight, efficient four-op solo practice, 98% insurance. High disposable income. Parents send their kids and their kids marry and send their kids, many patients actually flossing. Will share excellent hunting and fishing spots. 20 jet flights weekly to sand and sun. Long summer days, 15-20 hours of daylight. Sound interesting? Please reply to CDA ACCESS Box # 2696. (02/02)

SASKATCHEWAN - Regina: Seeking an associate for our busy, quality oriented general practice. We are looking for an enthusiastic, energetic professional with a pleasant caring attitude, willing to work extended hours. Equity position possible. Please call (306) 584-8115. (02/02)

MANITOBA - Winnipeg: Overhead too high? Underutilized 1,200 sq. ft. office, close to downtown Winnipeg. We are looking for a full or part-time cost sharing associate with own patient base. Please reply to CDA ACCESS Box # 2697. (02/04)

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BRITISH COLUMBIA - Whistler: Timeshare for sale, 1/10 ownership (5 weeks - 2 winter, 1 summer, 2 spring or fall) Whiski Jack at Ironwood. One bedroom 875 sq. ft., overlooking golf course, ski runs and town center. Hot tub, pool, RCI affiliate, $42,000, fully deeded. Call David Charbonneau (604) 987-1694. (01/03)

BRITISH COLUMBIA - Whistler: Whistler rated #1 ski resort in North America. Family condo available for rent. $200 per night, weekly rates available. Creekside, walk to lifts. Three bedroom, one & half bath, washer & dryer, sleeps 8-10 persons. Phone (604) 231-7015. (02/02)

ALBERTA: Dentist & spouse plan to tour Maritimes starting in Halifax approximately from July 27 to August 10, 1996. I wish to rent or trade R.V. with washroom and kitchen. Call Dr. Ron Gish, Lacombe, Alberta (403) 782-6900 Mon-Thur. (02/02)

LAS VEGAS - Nevada: Timeshare for sale, fully deeded, owned since 1989. Current value $11,400, equity $8,650 selling for $4,000 (U.S. funds). Call Dr. Ron Waddell (604) 746-5444. (01/02)

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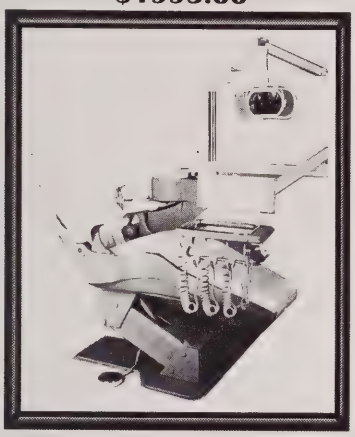

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The CDA Convention in Montréal
— A First Since 1987 —

Nine years have already gone by since the Canadian Dental Association held its meeting in Montréal! Now, more than ever, the profession must come together and what a better place than in the beautiful city of Montréal.

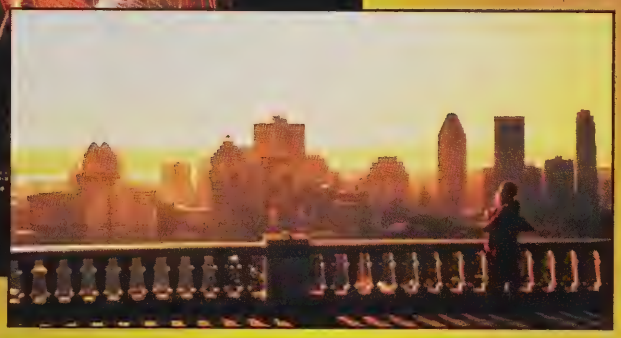
Your participation is primordial to ensure the success of this meeting. The Organizing Committee and Convention staff extend to you a most cordial invitation to attend the 1996 CDA Convention from August 17-20.

This is not just another year, we have a great show planned for you! Not only will you find a scientific program offered through a completely revised format, an exhibit hall displaying state-of-the-art equipment along with the events that you've come to expect during the Convention, but you will also have the opportunity to enjoy a city that is in itself ... an experience.

Come and rediscover Montréal! Exciting, lively, dynamic, sophisticated and fun are beckoning attributes of a city that is one big attraction. Your trip to the 1996 Convention will afford you an opportunity to experience one of the most romantic and welcoming cities in North America.

Museums! All the museums in Montréal have a distinct character enabling visitors to discover art, architecture, history, archaeology, religion and humour which all have their own edifices. While you're in town, among the key exhibits which are offered, you may want to visit *Daring Deco: Styles and Lifestyles* at the McCord Museum of Canadian History or the works of *Kiki Smith* and *Rene Magritte* at the Montréal Museum of Fine Arts. You may also wish to visit the Musée d'art contemporain de Montréal which will feature an exhibit of *Paul-Emile Borduas* paintings as well as *The Locus of Memory Works* by American Artist *Louise Bourgeois*. Finally, the Canadian Centre for Architecture will present, as part of its five-part American Century series, the works of *Frank Lloyd Wright* entitled *Shaping the American Landscape*.

Streetlife! Cappuccino, mochaccino, café au lait or café glacé, the choice is yours. Montréal is renowned for its sidewalk cafés where you can sit and relax with friends or simply take pleasure in people watching. Whether you walk along the downtown streets or amble through the narrow, cobblestone streets of Old Montréal, you can expect to feel the warmth and hospitality of Montréalers. Street musicians thrive on delighting you with their music and countless other street entertainers contribute to add sparkle to your visit. Night owls can also indulge to their heart's content in a city that bustles with activity to the wee hours of the morning.



Shopping! For fun, food and fashion, nothing beats a stroll through the streets of Montréal. A 29-kilometre pedestrian underground network links almost the entire downtown and lets you walk from major shopping centres to other more traditional department stores. Streets such as St-Denis, St-Laurent and Sherbrooke let you discover a plethora of art galleries, avant-garde fashion boutiques and ethnic marketplaces.

Much more... A city such as Montréal has much more to offer than can be depicted here. For the 1996 Convention, we have put together a program of excursions and tours tailored especially for participants and their families. Adults and children alike can explore Montréal and its surroundings more fully by joining us on these days of discovery.

For more details on the visits and tours, watch for the Preliminary Program which will be sent to all Canadian dentists in March. If you need more information now, please contact the Convention department at 1-800-267-6354.

Your Montréal colleagues are looking forward to welcoming you next August!

FDI 1996 • Orlando, Florida

September 28 - October 1, 1996

In 1996 the American Dental Association is teaming up with the World Dental Federation to bring you the 84th World Dental Congress. Take a look at some of the exciting events and programs to take place at this international meeting.

Special Events

- ★ Opening Ceremony
- ★ President's Dinner Dance
- ★ Celebrity Speaker – James Lovell (captain of Apollo 13)
- ★ Evening Adventure at Sea World

Tour Program

- ★ Kennedy Space Centre
- ★ Behind the Scenes at Walt Disney
- ★ Park Avenue Shopping and Tour
- ★ Saks Clearinghouse (special store opening with champagne continental breakfast)
- ★ Cypress Gardens Tour
- ★ Rivership Cruise on the St. Johns
- ★ Bass Fishing
- ★ Golf Tournament at Disney's Eagle Pines
- ★ Airboat Adventure and Nature Haven ... and more

Youth Program

- ★ Sea World
- ★ Show Biz Magic
- ★ US Space Camp

Scientific Program

★ The scientific program offers a wide array of lectures in contemporary dentistry world wide.

Dental Tours

★ **Private** – Visit several private dental offices in the Orlando area. See state-of-the-art technology and office design in an orthodontic practice and an oral surgery practice.

★ **University** – Visit the College of Dentistry at the University of Florida in Gainsville. Tour outpatient dental clinics, postgraduate and specialty clinics, offices for faculty, lecture and seminar rooms and teaching and research laboratories

Air Flight & Hotel Accommodation

The Canadian Dental Association has arranged a special air fare rate and five nights accommodation at the deluxe Castle Hotel (Holiday Inn Select) in Orlando, Florida through Tourcan Vacations.

Pre- and Post-Congress Tours

The CDA in cooperation with Tourcan Vacations has also designed the following holiday tours especially for CDA member dentists:

- Gulf of Mexico Cruise (September 23-27)
- Walt Disney World (October 2-6)
- Galapagos Islands (October 2-10)
- Costa Rica (October 2-11)

To receive an FDI 1996 registration package or CDA 1996 tour brochure, contact CDA Conventions at 1-800-267-6354.

This month we are featuring the 1996 Out-of-Country dental seminar to Morocco (June 29 - July 14). Designed especially for CDA member dentists by Tourcan Vacations and CDA. The tours offer participants the opportunity to learn about dentistry in another part of the world while experiencing a completely different and interesting culture.

The following are descriptions of some of the cities you will visit in Morocco (descriptions are only highlights and not all cities are listed).

MOROCCO

Casablanca is the business and commercial hub of Morocco. Your stay in Casablanca will include visits to United Nations Square, Central Market, the harbour area, Royal Palace and Esplanade. You can also observe the remains of the Portuguese occupation during the 11th Century.

Rabat is the administrative Moroccan capital and one of the four Imperial Cities. Tour visits include the Mechourar and Royal Palace, Kasbah Chellah, Hassan Tower and Mohammed V Mausoleum.

Meknes is an ancient Islamic capital and another of the Imperial Cities. Visit the Bab el Mansour, El Heri, the Mellah, Dar Jamai Palace and the Volubilis. Roman ruins, the House of Orphus, the Gallien Baths and the Temple of Venus are also enchanting tourist sites.

Fes is a classic North African city divided between a ville nouvelle (a french-style town) and a medina (reminiscent of the middle ages era). While in Fes, visit the medieval medina and several other tourist attractions as you make your way through twisting passageways. Enjoy the marketplace where craftsmen still labour in the age old oriental tradition.

Erfoud is the town you'll reach after travelling through the wooded middle Atlas mountain. Upon arrival, visit Azrou, a handcrafts centre, Ifrane, a ski resort and Zad Pass.

Ait Ben Haddou is a fortified village which contains one of the most spectacular fortresses in the south of Morocco. It is also home to the ruins of the ancient Kasbah, the Donjon.

Essaouira is a fascinating old Portugese walled town. This town houses a large jewellery souk and many shops selling exquisitely crafted wooden and ivory pieces as well as colourful clothing.

Marrakesh is a large, prosperous town with palaces, tombs and mosques worthy of attention. You'll have an opportunity to tour these historical sites as well as admire a few gardens and browse through another marketplace before attending a dinner show at a Moroccan restaurant.

* While on tour, three daily meals will be included.

Other CDA 1996 Out-of-Country Seminars

Egypt	March 1 - 10
South Africa	May 3 - 16

For more information or to receive a brochure contact CDA Conventions at 1-800-267-6354.

INSTRUCTIONS TO CONTRIBUTORS

The *Journal of the Canadian Dental Association* welcomes the submission of previously unpublished articles, critical reviews of material on advances in dentistry, and clinical reports for consideration for publication. Material is accepted for publication on the understanding that it is submitted solely to the *Journal* and that it has not previously been submitted elsewhere.

Research Articles:
Are contributions dealing with research, diagnosis and treatment of dental disease, studies in education, clinical and laboratory research, and other detailed investigations pertinent to dentistry and related fields. The text should not exceed 2,500 to 3,000 words.

Clinical Reports:
Are brief (up to 2,000 words) reports, case histories and clinical observations. References should be limited and a minimum number of illustrations used.

Opinions:
That are fully documented (800 words or less) will be reviewed for publication at the discretion of the editor.

Manuscript Requirements :
Submit three (3) copies (original and two (2) duplicates) to the Editor, *Journal of the Canadian Dental Association*, 1815 Alta Vista Drive, Ottawa, Ontario K1G 3Y6. All graphs, photographs, charts and tables must also be submitted in triplicate. Authors are asked to submit their articles on computer disks, if possible, stored in WordPerfect, Word Star or ASCII. (IBM compatible programs, i.e. DOS-based, are definitely preferred.) Hard copy, in triplicate, must still be provided for articles submitted on disk. For more details, please contact the editorial staff.

A covering letter designating one author as the correspondent, with his or her full address, telephone number and fax number (if available), must accompany the article. All scientific articles are subject to review by selected consultant referees. Acceptance or rejection of an article for publication is based on the referees' reports plus editorial consideration.

The editor reserves the right to edit manuscripts for stylistic consistency, clarity and conciseness. The author named as correspondent will receive a copy of the edited manuscript for checking prior to publication. If the author does not respond promptly, within the time allotted, his or her acceptance of the final article will be assumed. No exceptions will be made.

Manuscript Format:
All material (title, abstract, text, references, tables and legends) should be typed, double-spaced, on one side of 8 1/2" x 11" pages, with margins of at least one inch on all four sides.

Article Titles:
Should be descriptive but concise and suitable for indexing. Lengthy titles will be subject to editing.

Abstract:
Stating the purpose, results and conclusion of the work must accompany all manuscripts. All abstracts will be translated into French (or English, as the case may be). Abstracts should be approximately one typewritten page (250 words in length), maximum.

Authors Affiliations:
The authors' names, degrees, and university affiliations must be provided. Authors are responsible to disclose to the Editor any financial interests they may have in products mentioned in their article.

References:
Should be selective. They must be keyed to the text and numbered consecutively. *Journal* references must give the author's name, article title, abbreviated journal name, volume number, first and last page numbers of article and year of publication, i.e.,
1. Hechter, F.J., Symmetry and dental arch form of orthodontically treated patients. *JCDA* 44:173-184, 1978.

For books, give the author's name, book title, location and name of publisher, and year of publication, i.e.,
2. Kilpatrick, H.C. *Works simplification in dentistry*, ed. 2, Philadelphia, Saunders, 1964.

Illustrations:
Should be of high (professional) quality for reproduction.

All photographs should be submitted in triplicate as glossy black and white or color prints, or as color slides. When color slides are submitted, authors may submit one color slide and two glossy color prints of each illustration rather than three color slides.

On the back of each print or slide, the figure number and the top edge should be indicated lightly using a grease pencil. Each set of photographs and slides should be placed in a separate envelope and marked with the authors' name and the title of the article. Photographs and slides may be kept on file in the *Journal* department for up to a year following publication. Authors may request return of their illustration only up until that time. (The editor reserves the right to print color prints or slides in either black and white and/or color, as he sees fit.)

Graphs and line drawings should be of professional quality. The original drawing should be submitted, if possible, or a black and white glossy print of the drawing.

Tables, Charts and Graphs:
Should be well organized to complement the text. They should be keyed by number in order of appearance in the manuscript. Each of these illustrations should be on a separate page with title and footnotes.

Legends:
For all illustrations must be typed (grouped) on a separate page. Photomicrograph legends must specify original magnification and stain.

Most articles are published at no cost to the author, but a fee could be levied if extensive illustrative, formular, tabular or photographic matter is used.

Permissions and Waivers:
Must accompany the manuscript. Waivers are mandatory for the publication of photographs or patients unless faces are masked to prevent identification. Waiver forms are available from the *Journal* of the Canadian Dental Association. Permission of the author and publisher must be obtained for use of previously published material quoted in the text and for use of previously published illustrations.

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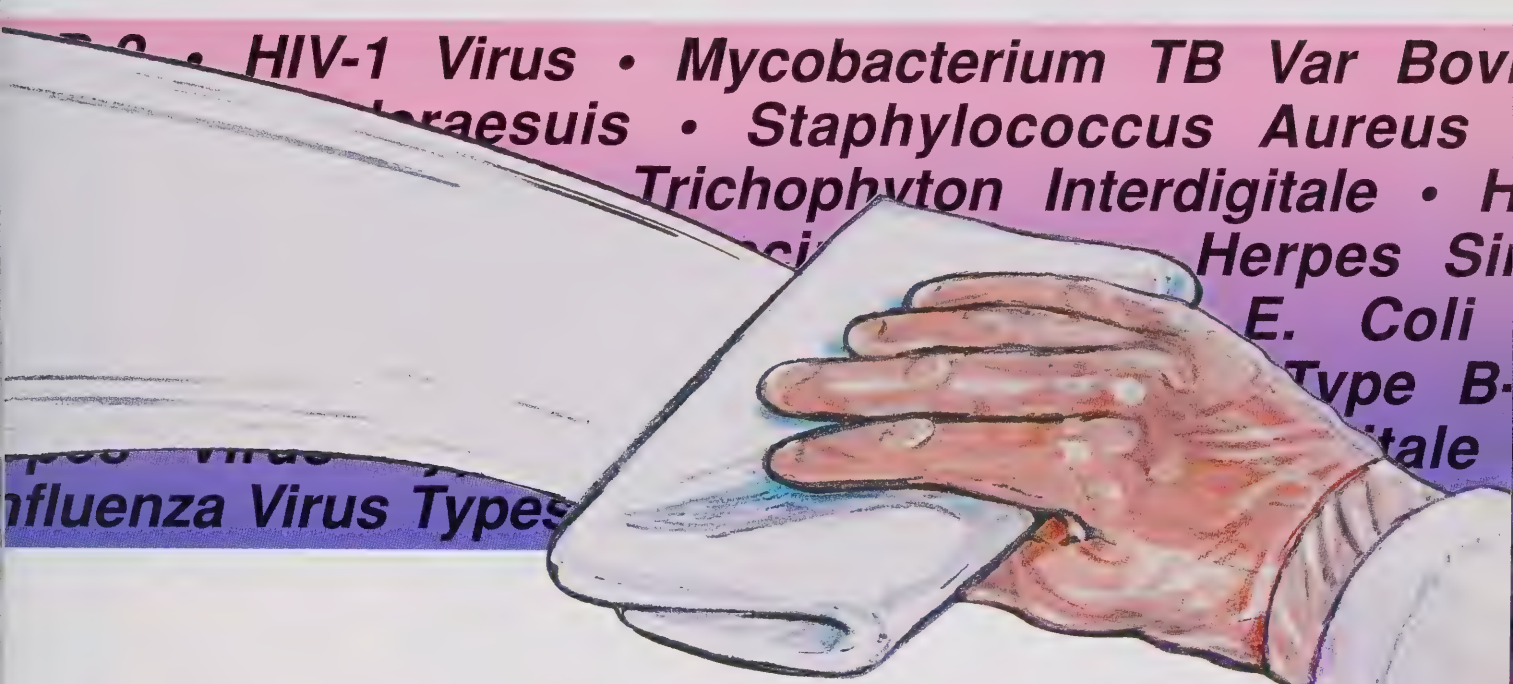

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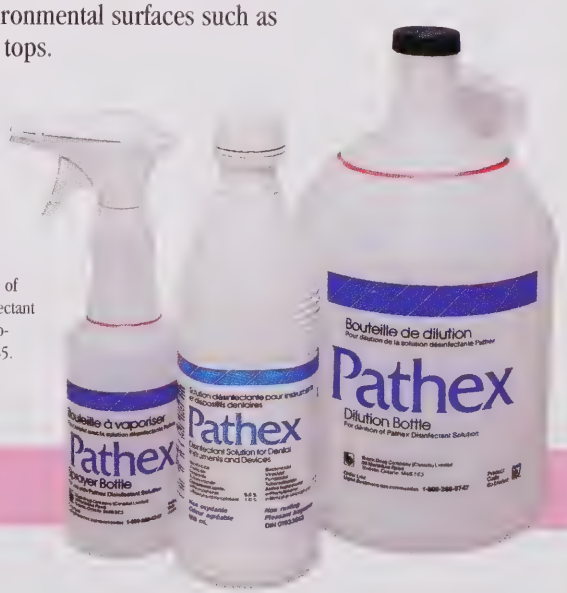
References:

1 Data on file.

2 Block, Seymour S. Disinfection, Sterilization and Preservation. Fourth Edition, 1991.

3,4 ADA Council on Dental Therapeutics. Acceptance of (Synthetic Phenol) disinfectant for instruments and equipment. JADA 110:394, 1985.



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1. Overholser CD et al. Comparative effects of two chemotherapeutic mouthrinses on the development of supragingival dental plaque and gingivitis. *J Clin Periodontol* 1990;17:575-579.
2. Data on file. 1995

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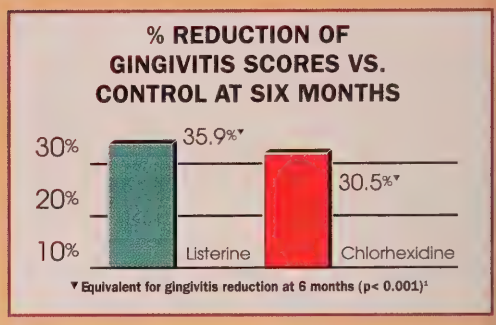

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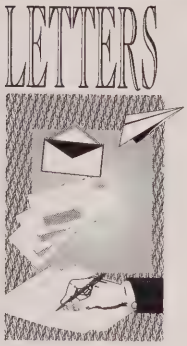

Tori Mandibularis

Pynn et al, in their excellent review article "Tori Mandibularis: A Case Report and Review of the Literature" (*J Can Dent Assoc* 61:1057-1065, 1995), present a case description of the removal of mandibular tori that is predicted on their: "removal was required to facilitate the fabrication of new crowns on her molar teeth."

The photographs of this case did not depict impingement of the tori on any of the patient's molars, and the self-same crowns that are evident in the preoperative photographs (**Figs. 2a, b**) are seen in the three-year follow-up photograph (**Fig. 7**). Evidently, no new crowns were made, and in any case, could have been inserted without torus removal. Why, then, was crown fabrication proposed as justification for torus removal, when the crowning was never undertaken?

G.H. Sperber, BDS, MS
Faculty of Dentistry
University of Alberta

Authors' Response:

I thank Dr. Sperber for his interest in our article on tori mandibularis. He astutely points out that the crowns present in the three-year postoperative photograph are the original preoperative crowns. The patient had a change of heart postsurgery and decided to delay fabrication of new crowns, opting to undergo active orthodontic treatment to correct her Class II dental malocclusion with lower incisor crowding. Crown construction will occur at the completion of her orthodontic therapy.

I agree with Dr. Sperber in the fact that crowns could have been fabricated without the removal of the tori, however, these large tori were removed at the request of the referring practitioner for ease of fabrication of the new crowns. Tori of this magnitude are typically removed prior to complex prosthetic work, especially in edentulous patients, to aid in the retention of partial and complete dentures. No doubt, "fancy" custom trays could have been fabricated to accommodate the tri-lobed tori, however, in this particular case the patient had already had multiple episodes of trauma to the thin lingual alveolar tissue, and it was decided by the patient and family dentist that it would be in her best interest to have the tori removed.

It is unfortunate that Dr. Sperber chose to focus on one technical point in the article, which was influenced by the patient. The paper was intended as a review of the common pathology frequently seen by the general practitioner, rather than as a discussion of the technical aspects of restorative or prosthodontic dentistry.

Bruce R. Pynn, B.Sc., M.Sc., DDS, Dip. OMFS
Thunder Bay, Ontario.

Awareness Of Oral Cancer

The ongoing debate in the *Journal* regarding the merits of Orascan, if nothing else, has increased readership awareness of oral cancer recognition. For all head and neck cancers, the incidence rate is 17:100,000, making it very difficult for any private dental practitioner to develop expertise in diagnosis. Nevertheless, this cancer's high mortality rates are attributed to late treatment, which relates back to the medical and dental professions' poor record in diagnosis and initiating appropriate referral.

In 1993, the undersigned were funded by the Association of Canadian Faculties of Dentistry to review the teaching of hospital dentistry in all the Canadian faculties. Our findings suggested that few dental students are given an opportunity to spend time in a cancer program. This finding points to lost opportunities for students to see such patients in significant numbers, or to examine them with experienced oncologists.

As the population ages, the rates for all cancers will rise. It is timely for dental educators as well as Zila Inc. to be concerned about raising the awareness of the profession in this regard. As we know from other areas of clinical dentistry, the best way to learn is by actual experience, and in the case of oral cancer, the one oral disease that kills, more experience would make a lasting impression.

Felicity K. Hardwick, BDS, M.Sc.D., Cert. Pedo.
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Recognition Of Medically Necessary Oral Health Care

We are in partial agreement with the opinions expressed in the January 1996 "It's My Opinion" column by Drs. Epstein and Grushka (Recognition Of Medically Necessary Oral Health Care. *J Can Dent Assoc* 62:15-16, 1996). Starting from the premise that today's dentist faces intense competition in an increasingly caries-free society, the authors express the need for the general dentist to broaden his or her area of knowledge and practice to include recognition and treatment/management of medically comprised patients, etc. We agree. In short, it is felt that hitherto the profession has been successful in a narrow field of practice, which has led to the demise of the profession. The time is ripe to widen the scope of dental practice.

The authors offer various solutions. One is to increase the medical knowledge and experience of general dentists in training, notwithstanding ongoing cutbacks at the level of health care delivery. This may still be achieved, in our opinion, by improved programs at faculties of dentistry, and by working in association with faculties of medicine to offer improved clinical hospital internships in the doctoral program.

Drs. Epstein and Grushka also suggest creating a new specialty to reflect the changing realities of dentistry. This seems to us to be self defeating. To support their argument, they opined that existing specialties have been forced to fill the void by

expanding their current practice. Oral pathology was singled out as example of the presently "unworkable situation" of an over-extended specialty. Oral pathologists, they argue, are expected to apply the latest developments in a complex area of laboratory medicine. So be it. They claim that this specialty is thus overburdened and unable to provide assistance in the clinical diagnosis and treatment of the medically compromised. We think otherwise. Oral pathology is foremost a clinical discipline utilizing different scientific methodologies to arrive at correct diagnoses and treatment. In one situation, for example, this may require histological investigation, in another biochemical assay, and in another electrophysiological assessment, and so on.

In the words of Shafer, Hine and Levy, in their preface to *A Textbook of Oral Pathology*, "Oral Pathology represents the confluence of the basic sciences and clinical dentistry through the adaptation of methods and disciplines of those sciences basic to dental practice ... through information obtained by clinical histories and observation of patients."

Whether dental physicians/surgeons find themselves in a general dental office or hospital environment, they will certainly be required to treat medically comprised patients. Hence, every practitioner should be broadly trained to accomplish these aims as well as to know where and when to refer. Contrary to the view expressed by Drs. Epstein and Grushka, the dental profession is not "at odds with itself." Already, it has in motion the necessary general and specialist resources capable of dealing with oral health care needs in a more complex environment. What is really required is improved training and employment of these resources. Far from being overworked, there are relatively few dentists who practise the specialty of oral pathology in private practice or hospital setting. Most are found in faculties of dentistry. This is partly because, though the need is there, we as a profession have to broaden our frame of reference if we are to utilize our resources for generalists and specialists alike more effectively. We really have no pressing need to develop further redundant specialties.

Unlike Drs. Epstein and Grushka, we anticipate that ACFD and CDA will, in their wisdom, develop a vision of the future where the dental profession will be sufficiently prepared in the basic medical sciences and concepts of dental practice so as to allow it to recognize, treat and, if necessary, refer to already extant but more extensively trained specialties. When the demand increases, then the faculties of dentistry may open up their specialty oral pathology programs to a greater subscription of candidates to meet that demand.

A paramount lesson to be learned from the science of evolution of the species is that over-specialization often reduces the ability to successfully adapt to changing environments, ultimately leading to the demise of the species.

Martyn Thomas, B.Sc., BDS, FICCMO
Norman Thomas, BDS, PhD, FRCD, MICCMO, Cert. Oral Path.
Richard Thomas, DDS

I agree with our colleagues, Drs. Epstein and Grushka, that with changing population demographics and changing patterns of disease, dentistry must increasingly incorporate the role of "oral physician" into the practice of our profession. Undergraduate education in dentistry is certainly evolving in a direction that addresses this issue, with many facilities of dentistry modifying their curriculum to strengthen the medical foundations of the DDS or DMD degree.

In terms of postgraduate training, the IOM report "Dental Education at the Crossroads," to which Drs. Epstein and Grushka allude, makes the following recommendation: "That the emphasis be on creating new positions in advanced general dentistry and discouraging additional specialty residencies unless warranted by shortages of services that cannot be provided effectively by other personnel."

Hospital-based general practice residency (GPR) programs in dentistry are an invaluable opportunity for dental graduates who seek to enhance their expertise in the management of oral pathology and oral manifestations of systemic disease, and in the delivery of comprehensive oral health care to special patient populations, including the medically-compromised. In Canada, there are currently 17 hospital-based GPR programs. Demand for positions in these residency programs is growing and already exceeds supply. In terms of the future expansion of postgraduate dental educational opportunities, it may be more appropriate, as stressed in the IOM report, to expand and strengthen these training opportunities in advanced general dentistry rather than contribute to the continued fragmentation of our profession through the proliferation of new specialties.

Oral pathology is one of the existing dental specialty disciplines that, together with oral and maxillofacial surgery, is particularly focused on the dental/medical interface of health care. This also extends to the educational arena. Of the 17 GPR programs in Canada, five are directed by oral pathologists (directors of the other programs include five oral and maxillofacial surgeons, five general dentists with advanced training and experience in hospital dentistry, and two pediatric dentists).

As president of the Canadian Academy of Oral Pathology, I take exception to Drs. Epstein and Grushka's characterization of oral pathology as a purely non-clinical discipline. An informal survey of our membership indicates that 85 per cent of oral pathologists are engaged in clinical practices that focus on combinations of the following: diagnosis and management of oral disorders or oral manifestations of systemic disease; diagnosis and management of orofacial pain; and comprehensive dental treatment of medically-compromised patients. In fact, a few of our members restrict their practice to these clinical practice components of oral pathology and hospital dentistry, and are not directly engaged in any laboratory-based practice. Conversely, there are a few oral pathologists who focus almost exclusively on teaching and laboratory-based diagnostic and research activities. However, this is no different than a subset of academic staff in other dental specialty disciplines who may be drawn away from direct patient treatment.

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GUEST EDITORIAL

NUTRITION: WHAT PRIORITY DO YOU GIVE IT?

Donna Hennyey, BA, MA, RD

By the time we're 40, most of us have eaten approximately 51,956 times. This assumption is based on: an average four-hour infant feeding schedule; the normal childhood challenge, where growth spurts and instant dislikes play havoc with meal routines, and snacking wins out; typical teen years, when skipped breakfasts are frequently coupled with 2 a.m. pizzas and coke; and "maturing" years where meals and snacks tend to be merged with business meetings, celebrations and continuing education workshops; and 10 leap years.

Once we've done something nearly 52,000 times, we could reasonably expect to "have it down pat." This, and the fact that eating is so much a part of our daily routine, may explain why we often take eating for granted, and even choose foods automatically.

Despite our non-discriminating approach to food selection, public interest in nutrition has grown dramatically over the last two decades. Nutrition is increasingly recognized as an important determinant of health,[1] and Canadians seem to be more "nutritionally aware" than ever.[2] Clients, students, associates, friends, and even strangers demonstrate this "awareness" every day with comments about which foods raise (or lower) their weight, their cholesterol level, or their blood pressure. Dietitians welcome this type of interest. But this dietitian is alternately discouraged, frustrated and perplexed by Canada's nutritional reality — although there is considerable interest in good nutrition, not enough Canadians actually practise it. Why?

From the development of sophisticated techniques to monitor disease conditions (e.g. blood glucose monitoring in diabetics), to the virtual elimination of rickets in children through the fortification of a favorite food with vitamin D, our knowledge of how diet affects the body's complex biological systems is exploding.

Unfortunately, despite all the advances we've made in risk identification and disease reduction, the reality is that many Canadians, perhaps the majority,[3] do not follow even the most basic nutritional advice. This is particularly disappointing, when this information is readily available in Canada's *Food Guide To Healthy Eating*,[4] and through other sources. There may be many reasons to explain why some Canadians don't practise good nutrition, but the overriding perception seems to be that for something to be effective nutritionally, it has to be new, unusual, or extreme.

A recent governmental review of nutritional requirements and nutrient/disease relationships supports the same basic message that Canadians first heard 50 years ago: balance, variety and moderation.[1] This approach is not new, nor unusual, and definitely not extreme. But while our nutritional stockpile of information is advanced and impressive, too many Canadians are losing out by not putting it into practice.

If nutrition plays such an important role in keeping Canadians healthy, whose responsibility is it to promote good nutrition through healthy eating? People act on the information they have available, whether it is accurate or not. Inaccurate information, or misinformation, reduces the consumers' ability to determine and meet their nutrition needs. This information comes to the consumer both from deliberately misleading sources (often profit-motivated) and from others who are well intentioned but simply misinformed. Battling nutrition misinformation is an ongoing challenge for dietitians.

Addressing these issues is not solely the mandate of dietitians, however. We need help, a lot of it. I believe all health professionals share in this responsibility. While dietitians are specialists in the field of nutrition, eating in a healthy way and encouraging others to do the same is pretty straightforward most of the time. Dentists, because of frequent patient contact, are uniquely placed in the health care system to reinforce basic nutrition facts, correct the misinformed, and perhaps identify those Canadians who have fallen through the cracks in the system and need to be referred for specialized intervention. The pro-active dental practices that are already doing this reflect the current, general trend toward offering a more comprehensive and preventive approach to health care.[5] Canadians are not only interested in this type of approach, they've come to expect it. It's also a ready-made opportunity for dentists to provide more value-added service to patients. The healthy eating message reinforces patient education to reduce the cariogenicity of patients' diets.

March Is Nutrition Month

The Canadian Dietetic Association (a parallel association to the Canadian Dental Association) designates March as *National Nutrition Month* to increase Canadians' awareness of good nutrition. Unfortunately, with lives made increasingly busy by the demands of both job and families, the common perception is that healthy eating is too time-consuming. The objective of the 1996 campaign, "Nutrition to Go," is to move Canadians from simply being interested in good nutrition to practising it, regardless of where they eat.

Watch for media events kicking off Nutrition Month, and listen for public service announcements providing useful tips for eating nutritiously, on the go. It can be done.

For further information please contact Donna Hennyey, Department of Preventive Dentistry, 124 Edward St., Room 104B, Toronto, Ont. M5G 1G6.

Donna Hennyey is a nutritionist with the department of preventive dentistry, faculty of dentistry, University of Toronto.

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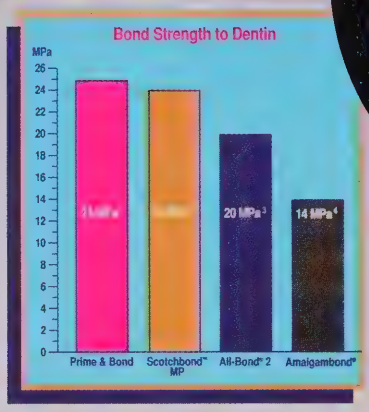

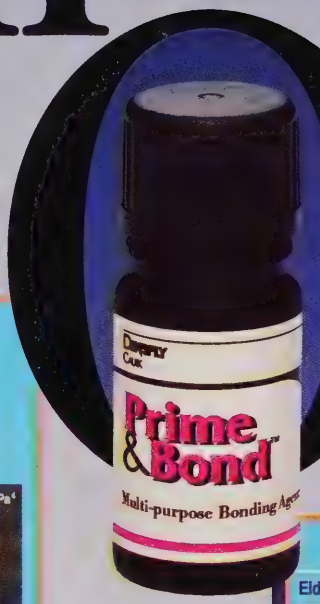

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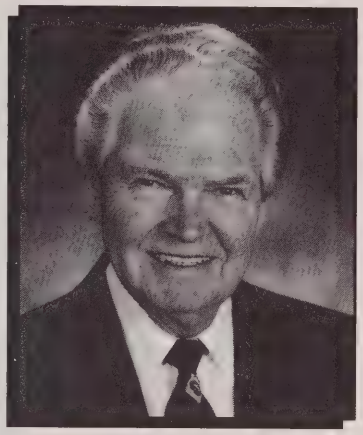
[1] Data on file. [2] "Scotchbond Multi-Purpose Dental Adhesive System Technical Product Profile," 3M Dental Products, 70-2008-5239-3, 7 & 14. [3] "Facts on All-Bond 2 Universal Adhesive System," Bisco Dental Products. [4] *Parkell Today* (October 1993): 5. [5] R.J. Elderton et al., "Clinical Investigation of K 71 for Cervical Lesions" (University of Bristol, 1995). N.M. Jedynakiewicz, N. Martin, J.M. Fletcher, "Clinical Investigation of the Restorative Material K 71 for Cervical Lesions" (University of Liverpool, 1995). Note: K 71 is Dyract™, a poly-acid modified composite resin, which is marketed by DENTSPLY International. [6] J. LoPresti, D.D.S., et al., "Evaluation of Prime & Bond: A Microleakage Study" (New York University College of Dentistry). [7] Requires use of adhesive cementation system such as Advance™. [8] Requires use of a composite adhesive cementation system such as Enforce™.

EDITORIAL

FRAUD — DO WE BLAME IT ON MONKEYS?



Dr. P. Ralph Crawford, Editor.

Anyone who has perused the newspaper lately has likely read what seems to be an increasing number of stories and headlines describing incidences of fraud, dishonesty and downright theft in our society — particularly among high-profile people and organizations.

Roh Tae-woo, the ex-president of South Korea, was recently indicted for setting up a $650 million U.S. slush fund. President Bill Clinton and wife Hillary have been implicated in the Arkansas Whitewater investment scandal. Former Canadian prime minister Brian Mulroney has faced some tough questions related to his role in Air Canada's recent purchase of Airbus 320s. And the list goes on.

Why do people get involved in fraud and cheating? It's a difficult question to answer, and an even more difficult problem to solve. If I knew both the answer and the solution, chances are that I wouldn't be a lowly editor.

Maybe the cause of the fraud problem is more readily apparent than we think. According to a December 1995 article that ran in the local newspaper's travel section, if tourists in the Chobe National Park in Botswana are not careful to protect their belongings, the local baboons harass and steal them blind. Can we blame our fraudulent demeanor on our ancestral monkeys?

History tells us — genes, evolution, or what have you, notwithstanding — that fraud and thievery have been with us from the dawn of time. And, like it or not, dentists are not exempt from these kinds of dubious activities. Every dental licensing body in Canada has had to handle at least one fraud case within the past 12 months.

A quick look at the Royal College of Dental Surgeons of Ontario's (RCDS) discipline committee hearings — as reported in *Dispatch* — may help to put the problem in perspective. Out of the 16 discipline cases outlined in *Dispatch* in 1995, 11 involved offenses such as signing false statements, charging excessive fees, billing for work that was never performed, and falsifying records — in other words, fraud.

The question is, when there are more than 6,200 licensed dentists in Ontario, should we really be concerned that 11 were found guilty of fraud in 1995? Is this unusual, is it the norm, is it a good indication of the extent of the fraud problem, or does it represent just the tip of the iceberg?

While there are no Canadian studies on dental fraud, some U.S. figures may help to shed some light on the situation here. According to a 1995 article published in the *Adjudicator* — the official publication of the Canadian Association of Dental Consultants — fraud losses accounted for 10 per cent of the total U.S. expenditure on health care in 1995, amounting to approximately $100 billion (U.S.). If the customary one in 10 ratio is applied to this figure, the annual losses due to fraud in the Canadian health care system would amount to more than $14 billion (Can.) — or $500 for every man, woman and child in the country.

But the *Adjudicator* article also reported on the U.S. National Health Care Anti-Fraud Association's belief that the overwhelming majority of American health care providers are honest and ethical. In fact, the association estimates that no more than one to two per cent of U.S. health care providers engage in deliberate and systematic criminal attempts to defraud private and public systems.

So, should we be complacent because only 11 of Ontario's 6,200 dentists — 0.2 per cent — were found guilty of fraud in 1995? No. Not when you consider that the implicated 11 represent only those dentists who were caught, put through the entire discipline committee system, and ultimately found guilty. How many dentists never get caught?

Dr. Raymond Wenn, a past-president of CDA, likely spoke for all honest dentists when he said: "Fraud cannot be tolerated in our profession. The Canadian Dental Association and all 10 provincial and territorial associations must take a strong stand on the issue."

Dr. Wenn charged the licensing authorities, the insurance industry and the public to be aggressive in weeding out those who would defraud and defame. He also indicated a need for stronger deterrents, including criminal investigations and court action. This is certainly a point of consideration. Take our 11 Ontario dentists: in addition to being assessed fines and varying costs, one received a two-month suspension, one got four months, six got six months and one got 12. And they could get their suspensions cut in half if they fulfilled certain in-office and continuing education requirements.

Three months out of an office is little more than an extended vacation. This just doesn't cut it. When it comes to fraud there must be zero tolerance. We just have to work harder and be more diligent to bring offenders to justice.

Nor can we blame fraud on our monkey ancestors. Monkey see, monkey do. In other words, we really don't know if the Botswana baboons steal because of their own instincts, or because they learned the trait from visiting tourists.

P. Ralph Crawford, BA, DMD
Editor of the Journal of the Canadian Dental Association

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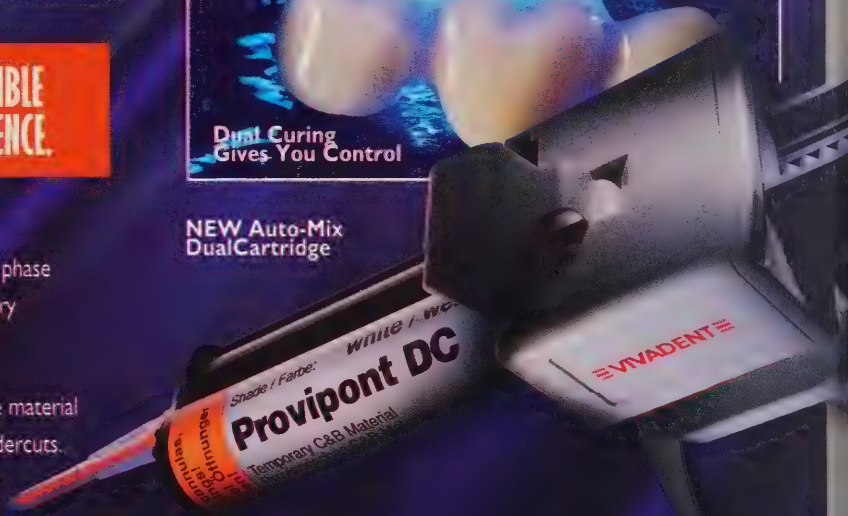

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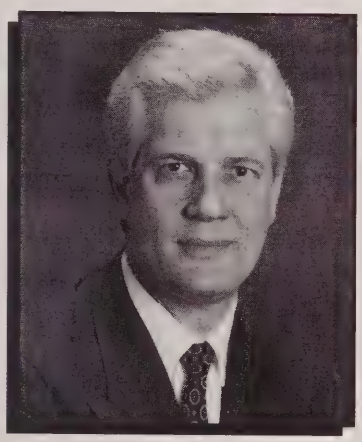
PRESIDENT'S COLUMN

GOOD NEWS ON AMALGAM



Dr. James R. Brookfield, CDA president.

Health Canada's recent meeting of silver amalgam stakeholders is starting to remind me of a bad championship fight. Not only did the event fail to live up to the pre-meeting build-up, the losing side took less than a day to declare the outcome unfair, biased and pre-determined.

This is unfortunate. As one of the two CDA representatives sitting around the table February 16-17 when the stakeholders gathered to discuss the merits of Dr. Mark Richardson's much-ballyhooed paper — "Assessment of Mercury Exposure and Risks From Dental Amalgam" — I can vouch for the fact that the meeting was conducted fairly. Both sides had equal opportunity to express their views and be heard.

It wasn't always friendly, and we certainly did not reach agreement on every point that came up for debate. But when it counted, the stakeholders voted unanimously to reject the findings of Dr. Richardson's study.

The end result was a "consensus position regarding the amalgam risk assessment" and eight specific policy recommendations. In effect, the 19-member stakeholders' committee determined that, although Dr. Richardson's "amalgam risk assessment was done in a careful and conscientious manner with methods generally appropriate for this type of risk assessment ..., given the poor quantifications of exposure in the key study used, it is inappropriate to conclude that a TDI (Tolerable Daily Intake) set using this approach represents a distinction between health and disease."

Put in plainer language, the stakeholders unanimously agreed that Dr. Richardson's paper and its conclusions were scientifically invalid. Equally important, the committee's first policy recommendation to Health Canada states that: "The evidence does not exist to warrant the wholesale removal of amalgam fillings."

However, and rightly so, the stakeholders also recommended that: "Medical and dental practitioners should be alert to the fact that some individuals have sensitivities to amalgam ..." and that all individuals should have "the right to participate in the selection of the materials that will be placed in their mouth."

The most contentious policy recommendation was likely number four, which states that: "Although there is no evidence that dental amalgams contribute to immunological, neurological or kidney disease in human populations, there is some evidence that mercury exposure from all sources is of more significance to individuals with those problems than to the general population ..."

Despite all the backtracking that has gone on in the media since the stakeholders' meeting, everyone at the table, including Dr. Murray Vimy, gave their unqualified support to the committee's consensus position rejecting Dr. Richardson's paper and its first policy recommendation.

Dr. Vimy, who now calls the stakeholders' meeting a "sham," resigned from the committee as it voted to approve the fourth of its eight policy recommendations to Health Canada. Despite this, he has stated publicly that the committee never reached a consensus, that it was stacked in favor of the pro-amalgamist side, and that its members were primarily "a group of lay people and political-type dentists who knew nothing about science."

I beg to differ.

Prior to the stakeholders' meeting, CDA assembled an international panel of scientists to review Dr. Richardson's paper. This panel included several of the world's leading researchers on silver amalgam and mercury toxicity, including Drs. M. Bergman and A. Berglund of Sweden, Dr. D. Arenhold-Bindslev of Denmark, and Dr. Derek Jones of Canada. It ultimately concluded that Dr. Richardson's paper was seriously flawed in a number of critical areas.

In particular, the Richardson paper uses the findings of a 1983 study by Fawer et al to calculate a TDI for the mercury released from dental amalgam restorations — despite the clear inconsistencies and deficiencies of this report. Further, the study Dr. Richardson uses to determine the baseline rate at which mercury vapor is released from amalgam restorations — a 1994 report by Skare and Engqvist — is also questionable.

These concerns are not unique to the CDA panel. Every scientist who attended the stakeholders' meeting identified the same flaws in the Richardson paper, and agreed that its conclusions were not scientifically valid.

Dr. Vimy and the anti-amalgamist side may not like it, but Health Canada has already indicated that it will not use Dr. Richardson's numbers when it draws up its new policy on silver amalgam later this year. And both the committee's consensus position and its eight policy recommendations should considerable weight in the impending discussions on amalgam. Science, not misinformation and zealotry, must be the determining factor.

This is good news for both dentists and their patients. Silver amalgam is still the longest lasting, most cost-effective dental restorative material we have. If Health Canada allows it to be washed away by a wave of misinformation, our patients will be faced with higher costs and more frequent recare visits.

Despite this, we must remember that our patients will, and should, have the final say on silver amalgam. We can ensure that they have the knowledge to make an informed decision about what goes into their mouths, but that choice must be theirs.

James R. Brookfield, DDS
President of the Canadian Dental Association

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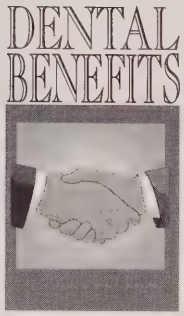

A Prescription For the Future of Dental Benefits In Canada

David Somer, DDS

One of the major threats facing dentistry today is the possible erosion of dental benefit plans. If this occurs, either through taxation, the birth of managed care schemes, a shift toward flex plans, or through employers placing restrictions on dental coverage, both patients and the dental profession will be the ultimate losers.

Dentistry should be proud of its accomplishments and the enormous gains that have been made in improving the oral health of Canadians over the last two or three decades. Through our ongoing efforts to promote fluoridation, dental awareness, and prevention, we have virtually eliminated dental caries in children and, equally important, helped adults to gain a better understanding of the value of dentistry.

The other key factor in the dental health equation has been the growth of employer-sponsored dental benefit plans in the '70s and '80s, which led to a significant increase in the utilization of dental services by Canadians. Now those plans are being threatened. Many employers are seeking to reduce their costs in order to compete effectively in the global marketplace. This is a concern for both dentists and their patients.

Managed care is already making significant inroads in the United States, while flex plans, which allow employees to structure their own benefits package, are becoming increasingly common on both sides of the Canada-U.S. border. If this trend continues, Canada's unique — and highly successful — system of oral health care delivery may be compromised.

CDA established its new steering committee on dental benefits issues in response to the threat posed by managed care and the erosion of existing dental benefit plans. The goal of the new committee, which met for the first time in October 1995, is to help the profession maintain control of dental care in the interests of patients and dentists by developing initiatives to communicate effectively with target publics, and to foster development of funding arrangements supportive of optimal oral health care.

Following the committee's inaugural meeting last year, Mr. Brian Henderson, CDA's director of professional services, and myself, as the committee chairman, met with members of the American Dental Association (ADA) in Chicago to review their experiences and progress in the dental benefits area. Elements of a strategic plan emerged from that meeting, which were subsequently further refined in cooperation with CDA's communication and membership committee. The plan is currently being put into its final form.

It is expected that dental benefits issues, encompassed in the strategic plan developed by the committee, will be the primary focus of the new CDA Public Education Program (CPEP). This innovative program, and the necessary funding to make it happen, was developed by the communications and membership committee last year. It has been endorsed by CDA's executive council and is awaiting final approval from the board of governors.

The essential elements of the strategic plan on the dental benefits issue will likely be:

1. To develop practice management software (in cooperation with ADA) that will enable CDA member dentists to measure the financial impact of various managed care or preferred provider organization (PPO) proposals on their individual practices. This simple program will allow dentists to enter their own financial and practice data to generate a specific spreadsheet.

2. To develop CDA informational brochures, advertisements and, eventually, on-

line Internet pages on various topics related to dental benefits issues, such as:

- industry cost containment
- the management role of the dental profession
- alternate delivery systems and their implications
- the patients' right to optimal care and freedom of choice
- dental fraud and zero tolerance

This information will be made available to dentists, patients, government and industry on a need-to-know basis, depending on the topic.

3. To investigate the feasibility of establishing a national cost-plus direct reimbursement system, controlled by dentists, to offer Canadian employers an alternative to conventional insurance-industry-managed benefit plan administration. The committee is currently consulting with the Alberta Dental Services Corporation, which manages the province's Quik Card program, in this regard.
4. To assess the knowledge and awareness of Canadians on the dental benefits issue, as well as their understanding of CDA's role in protecting Canada's unique oral health care delivery system. A national poll was conducted in February to gather the necessary data.
5. To set the stage for a national managed care seminar in conjunction with the CDA Convention, and to develop speakers packages for use in a regional seminar program. This process will begin once the poll results have been analysed.

The strategic plan will be finalized within the next two months, following the committee's next meeting. Once it is in place, we will have taken a huge step forward in our efforts to promote and provide optimal oral health to our patients. ■

Dr. David Somer maintains a private dental practice in Hamilton, Ontario. He is a member of CDA's executive council and the chairman of the CDA steering committee on dental benefits issues.

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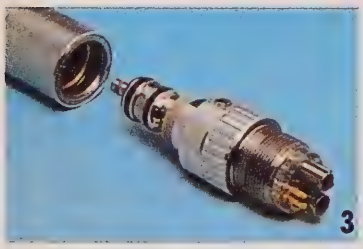

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The SLSA Program is published as a monthly feature in the *Journal of the Canadian Dental Association* as a resource for dentists wishing to enhance their dental knowledge and expertise. It is intended as a vehicle for self-learning and self-assessment. The program is based on a series of 40 questions, answers, rationales, and references, followed by an annual 15-question quiz. The 1995-96 quiz will appear in the June 1996 issue of the *Journal.* Answers to the quiz will be published in the August 1996 issue. Dentists who complete the quiz may be eligible to receive continuing education points, and their names will be forwarded to their provincial licensing bodies for consideration.

Questions 26 through 30 are a repeat of the questions that appeared in the February issue of the *Journal* accompanied with correct answers, the rationales and specific references. Question 31 through 35 are new questions — watch for their answers and rationales next month. Keep all copies of the *Journal* so you can correctly respond to the June 1996 quiz.

QUESTION 26

Erythromycin affects metabolism of terfenadine. Ketoconazole reacts with terfenadine to cause ventricular arrhythmias.

A. The first statement is true, the second false.
B. The second statement is true, the first false.
C. Both statements are true.
D. Both statements are false.

ANSWER: C

RATIONALE:

Terfenadine (Seldane) is an over the counter antihistamine commonly used in the treatment of hay fever. Recent research has shown that when administered along with either the antifungal agent ketoconazole (Nizoral) or erythromycin there are adverse effects.

With Nizoral, patients taking Seldane can develop life threatening ventricular arrhythmias. Erythromycin interferes with the liver metabolism of Seldane by forming compounds that inhibit enzyme breakdown which can lead to cardiac toxicity and ventricular tachycardia. Other macrolide antibiotics like erythromycin are being investigated for similar properties.

REFERENCES:

(1) Wynn, R.L. Erythromycin and Ketoconazole (Nizoral) associated with Terfenadine (Seldane)-induced ventricular arrhythmias. *Gen Dent* 41(i):27-29, 1993.

(2) Becker, D.E. Drug interactions in dental practice: a summary of facts and controversies. *Compendium* 15:No.10, 1994.

QUESTION 27

Immediately following the placement of an endosseous implant to replace a single tooth, full functional loading will

(1) stimulate bone formation.
(2) result in bone loss.
(3) cause fibrous tissue encapsulation.
(4) result in epithelial downgrowth.

A. (1) only
B. (1) and (4)
C. (2) (3) (4)
D. (3) and (4)

ANSWER: C

RATIONALE:

Biocompatibility has been recognized as a necessary property for success of any implant. However, it should be noted that not only the materials used for implant fabrication but also the design of the implant will determine the overall tissue response. Premature function can result in excessive movement of the implant relative to its host bone during the early healing phase. Such movement could result in the formation of fibrous tissue rather than bone in close apposition to the implant surface and epithelial downgrowth at the "gingi-

val" cuff around the implant will be accelerated. Therefore, in order to allow rigid implant fixation to occur (osseointegration) there is a need for a period of non-function (or limited function) after implant insertion. Success is equally dependent upon the prosthodontic treatment and the design of appliances is important, particularly in avoidance of plaque retention.

REFERENCES:

(1) Pilliar, R.M. Dental implants: Materials and design. *J Can Den Assoc* 56(9):857-860, 1990.

(2) Worthington, P., Brånemark, P-I. Advanced Osseointegration Surgery. *Applications in the Maxillofacial Region.* Quintessence Publishing Co., 1992.

QUESTION 28

Aspartame (an artificial sweetener) is

(1) a combination of phenylalanine and aspartic acid.
(2) less sweet than sucrose.
(3) sweeter when heated.
(4) contraindicated for persons with phenylketonuria.

A. (1) and (4)
B. (1) (3) (4)
C. (2) (3) (4)
D. (4) only.

ANSWER: A

RATIONALE:

Aspartame is a combination of aspartic acid and phenylalanine. It is two hundred times sweeter than sucrose and is sold under the trade name of Nutra Sweet. It loses its taste on heating and should be avoided by people with phenylketonuria since this condition is a genetic defect of phenylalanine metabolism.

Sweeteners are classified as bulk or intense. In general, the bulk sweeteners are non-cariogenic but contain the same calories as sugars. Xylitol and Sorbitol are bulk sweeteners and therefore caloric. Saccharin and aspartame are intense sweeteners and are virtually calorie-free as well as being non-cariogenic.

Saccharin was one of the first intense sweeteners to be discovered in the late 19th century. It is 200-500 times sweeter than sucrose and until recently was used extensively to sweeten foods and low calorie drinks. It is gradually being replaced by new sweeteners such as Aspartame.

REFERENCES:

(1) Shaw, J.H. and Roussos, G.G. *Sweeteners and dental caries.* Information Retrieval Inc. Washington, D.C., 1978.

(2) Rugg-Gunn, A.J. and Edgar, W.M. Sweeteners and dental health. *Community Dent Health* 2:213, 1985.

QUESTION 29

The smear layer

(1) is 8 to 10 microns thick.
(2) consists of collagen only.
(3) is porous.
(4) is attached weakly to dentin.
(5) reduces post-operative sensitivity.

A. (1) (2) (3)
B. (3) (4) (5)
C. (2) (3) (4)
D. All of the above.

ANSWER: B

RATIONALE:

The smear layer produced on cutting enamel and dentin contains hydroxyapatite crystals and denatured collagen. It is 1-5 microns thick. Although part porous, the smear layer reduces dentinal fluid flow from the tubules, thus decreasing postoperative sensitivity and providing a drier surface to help adhesion. The smear layer, however, is weakly attached to the underlying dentin and for this reason, new adhesives partially remove and penetrate this layer. In addition, since dentin becomes "wet" with dentinal fluid, the new bonding agents include hydrophilic monomers to penetrate the moisture layer. Another major factor affecting dentin adhesion is the number of tubules available for mechanical retention. Furthermore, the length and orifice size of the tubules will also affect the end result. Since age affects sclerosis of dentin and therefore numbers of available dentin tubules this should be taken into account when dentin bonded restorations are being considered in the older patient especially in the Class V restoration.

REFERENCES:

(1) Heymann, H.O. and Bayne, S.C. Current concepts in dentin bonding: focusing on dentinal adhesion factors. *JADA* 124:27-42, 1993.

(2) *The Oral Care Report.* Vol. 4. Ed. G. Nikiforuk. June, 1994 .

QUESTION 30

Sealant application to posterior composite resin restorations
(1) seals marginal defects.
(2) increases longevity.
(3) increases staining.
(4) reduces bacterial penetration.

A. (1) (2) (4)
B. (2) (3) (4)
C. (3) and (4)
D. All of the above.
E. None of the above.

ANSWER: A

RATIONALE:

In a recent study (Dickinson and Leinfelder 1993) Class I and Class II cavities were prepared with 90 degree cavosurface margins. The teeth were then restored with composite resin. After finishing to anatomic form, half of the restorations were then cleaned and after etching with 37 percent phosphoric acid for 30 seconds a sealant was applied. Evaluations over five years have shown a marked improvement in wear resistance in the restorations when a sealant was applied. In addition, the marginal integrity was improved and bacterial penetration and staining reduced.

Multiple microcracks and fine fracture lines are commonly found on occlusal surfaces of posterior composite resin restorations. The application of a low viscosity surface penetrating sealant seals these cracks and deficiencies. The technique is simple and greatly adds to the longevity of composite resin restorations in posterior teeth where marginal defects are still the main cause of replacement.

REFERENCES:

(1) Dickinson, G.L. and Leinfelder, K.F. Assessing the long term effect of a surface penetrating sealant. *JADA* 124:68-72, 1993.
(2) Quist, V. Resin restorations: leakage, bacteria, pulp. *Endod Dent Traumatol* 9:127-152, 1993.

The SLSA program is a resource and service, directed to the dental profession and the licensing authorities, which is intended to help dentists achieve and maintain the high levels of expertise and competence identified by Canadian dental licensing authorities. All questions and other material are based on current, referenced literature.

Financial support for the program has been provided by A-dec, Colgate, the Fowler-Pearce Partnership (Nesbitt Burns), Nobelpharma, and Sci-Can.

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THIS MONTH'S FIVE NEW QUESTIONS

QUESTION 31

Organisms trapped in fissures by sealants
A. interfere with the sealant adhesion.
B. cause pulpitis.
C. proliferate.
D. cause further enamel decalcification.
E. None of the above.

CDA encourages Canadian dental licensing authorities to recognize the SLSA Program as an appropriate and acceptable resource for dentists seeking to earn the continuing education credits required for the maintenance of licensure.

Currently, all 10 provincial licensing bodies — British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland — recognize the SLSA program for continuing education credits.

QUESTION 32

Compared to surgical lengthening of a tooth crown, forced eruption
(1) causes esthetic problems.
(2) reduces plaque control problems.
(3) requires the same precautions to avoid pulp exposure.
(4) is preferred in the anterior maxilla.

A. (1) and (2)
B. (1) (2) (3)
C. (3) and (4)
D. All of the above.

QUESTION 33

When the gingival margin of a Class II cavity preparation extends beyond the cemento enamel junction, you could restore the tooth with
(1) amalgam.
(2) cast gold.
(3) composite resin only.
(4) composite resin and glass ionomer cement.

A. (1) only
B. (1) (2) (4)
C. (3) only
D. (1) (2) (3)
E. All of the above.

QUESTION 34

In children recession of the gingivae on the labial aspects of mandibular incisors is self-correcting. Eight percent of children show labial recession on mandibular incisor teeth.
A. The first statement is true, the second false.
B. The second statement is true, the first false.
C. Both statements are true.
D. Both statements are false.

QUESTION 35

Prevention of alveolar bone loss in a patient with active osteoporosis requires
A. rigorous plaque control.
B. estrogen replacement therapy.
C. calcium supplements.
D. All of the above.

(Answers to questions 31-35 will appear in next month's *Journal.*)

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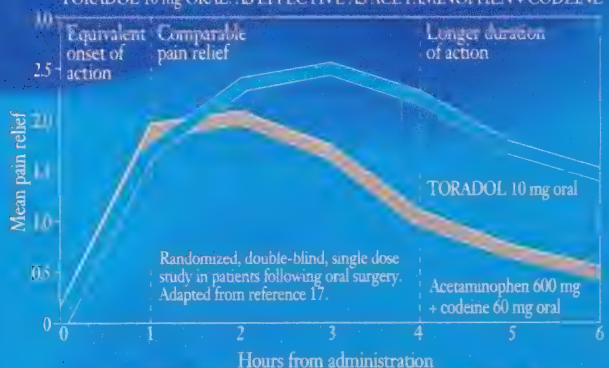

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Product Information On Page 244-245

NEWS UPDATE

CDA Takes Firm Stand On Amalgam Issue

In a bluntly-worded letter, CDA has alerted the new federal health minister, David Dingwall, that science — not public opinion — should be the deciding factor in any future changes to Health Canada's policy on silver amalgam.

"CDA will publicly insist on any proposed policy changes being demonstrably justifiable on scientific grounds," said CDA president Dr. James Brookfield. "While we have no wish to defend the use of silver amalgam if it is proven to present significant risks ... it is also clearly in the interests of the Canadian public (as dental patients and as individuals paying for dental insurance or dental care) not to abandon or constrain the use of a cost effective restorative material unless there is a demonstrable significant risk. Use of alternative materials would be a financial windfall for dentists, but without proven risk and risk analysis, it would be morally and ethically wrong."

Dr. Brookfield's letter was mailed to Mr. Dingwall February 2, about two weeks before CDA was scheduled to participate in a Health Canada-arranged stakeholders' meeting on the amalgam issue.

Health Canada, which is currently reviewing its policy on silver amalgam, called the meeting to allow stakeholders to comment on Dr. Mark Richardson's paper, "Assessment of Mercury Exposure and Risks From Dental Amalgam."

Released November 22, the Richardson paper proposes a tolerable daily intake (TDI) for the mercury vapor released from silver amalgam, based on an estimate of the Canadian public's exposure to mercury from amalgam, food and the environment. It also proposes two different models for the number of filled teeth that can be present in patients of various ages before this TDI is exceeded.

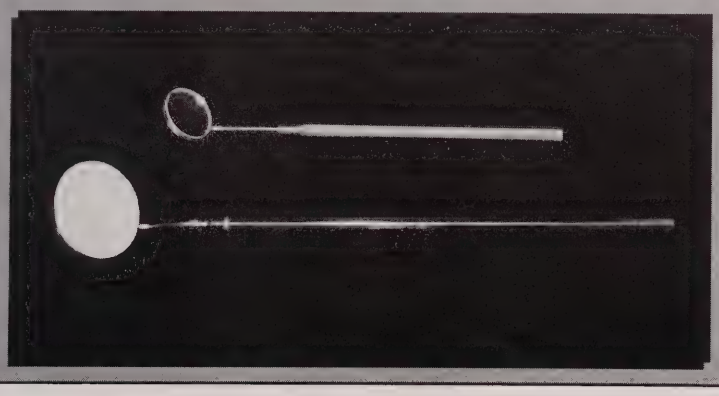
The first model, drawn from research conducted by Olsson and Bergman, suggests that no amalgam restorations can be placed in toddlers or children without exceeding the TDI, and that only two filled teeth are acceptable in teens, adults and seniors. The second model, which is based on the research of Richardson et al, suggests a limit of one silver amalgam restoration in toddlers and children, three in teenagers, and four in adults.

CDA convened an international panel of experts December 11 to analyze the Richardson paper, and prepare a report on its methodology, approach, and conclusions. That report, which was to be presented to Health Canada during the stakeholders' meeting (see President's Column, p. 197), identified several significant flaws and errors in the Richardson paper. ■

WHAT'S IT?

The "What's It?" column received several excellent responses identifying the oversized mirror displayed on page 27 of the *Journal's* January issue. Dr. John Peters of Goderich, Ontario, who donated the mirror to the CDA Museum, suggested that it may have been used in early radiography at the turn of the century. He referred us to the photo of Dr. Edmund Kell's office, which was reproduced on page 954 of the November 1995 *Journal*. The patient is holding a long-handled instrument in preparation for the X-ray beam, which would have been reflected back onto a fluorescing screen or onto the mirror itself.

Similarly, Dr. Abraham Rothstein of Winnipeg, Manitoba, informed the *Journal* that the mirror functioned as a miniature fluoroscope, and was marketed in the 1950s. The operator moved the mirror along the lingual surfaces of the teeth while the X-ray unit was in operation. This would reveal the presence or absence of root tips, root fractures, third molars, and any foreign objects. ■



CDA Advises Members On Saliva Ejectors and Water Lines

CDA sent a President's Letter to its members last month to advise them of recent media coverage on the potential for disease transmission to occur as a result of saliva ejector backflow and the presence of opportunistic organisms in dental unit water lines.

Distributed to CDA members with the Jan.-Feb. issue of *Communiqué*, the letter describes the potential for disease transmission to occur, the actual risk to patients from saliva ejector back flow and dental unit water lines, and possible solutions.

Current research indicates that biofilms containing opportunistic organisms such as pseudomonas, legionella and klebsiella are present in dental unit water lines, regardless of whether dental units are hooked to a municipal water supply or an independent source of sterile or distilled water. Although there are no reports of healthy individuals being infected with these types of organ-

Dentistry Canada Fund Update

The Dentistry Canada Fund held its annual meeting December 10, 1995, in Ottawa.

Much of the day-long meeting was devoted to reviewing DCF's progress over the past year and planning its future. The fund performed extremely well in 1995, as indicated by the following highlights: the annual appeal was $20,000 ahead of the 1994 campaign; guidelines for the operation of the Canadian Dental Hygienists' Association (CDHA), Canadian Dental Assistants' Association ((CDAA) (Penny Waite)), Frank Popovich and William Spence memorial funds were approved; grants were awarded from the Needy Students Fund (Nicholas Mancini and George Barrett endowments); and the format for the 1996 DCF/Aurum Ceramic $1-Million Golf Tournaments was approved.

Dental professionals will likely be particularly interested in the DCF Planned Giving Program, whose final components were accepted during the annual meeting. This comprehensive program offers a wide variety of options to allow donors to make a significant gift to a specific area of interest within DCF and, at the same time, maximize the tax and/or estate plan benefits associated with their gift. The program now includes donations of cash or appreciated property (stocks, bonds, art, etc.), as well as the Living Legacy Builder, an insurance-based program offered through ITT Hartford exclusively to DCF; compound interest (stripped) bonds, offered in association with Midland Walwyn; and Charitable Remainder Trusts, an exciting new method of "creditor-proofing" assets.

A full description of these options will appear in next month's *CDA Journal*. Details of these and any other DCF program can be obtained by contacting DCF's executive vice-president, Mr. James Wegg, at: (613) 731-0493.

Following the annual meeting, DCF vice-chairman Arthur Zwingenberger offered high praise to the fund's outgoing chair Dr. Gordon Thompson, for his "hard work, exceptional leadership qualities, and strong vision."

DCF's incoming chair, Dr. Douglas B. Smith, is a past-president of the Ontario Dental Association, and served for many years as a board member of the Canadian Dental Foundation — one of the five funds that amalgamated to form DCF.

After a joint meeting of CDA/DCF management committees in early January, Dr. Smith remarked that: "The spirit of cooperation and goodwill between our two organizations will serve everyone well and allow us all to raise both awareness and funds for the cause of optimal oral health for all Canadians.

Dental Office Survey Planned

Many dental offices will be asked to participate in a survey this March, which is being conducted by students from the McMaster University, Michael G. De Groote School of Business. The Block Drug Company, which is sponsoring this survey, has pledged to make a $500 donation to DCF as a symbol of its support of the fund's ongoing programs. A further $500 will be donated to DCF if 850 or more responses are received.

Annual Report

Copies of DCF's first-ever annual report (covering the first 18 months of the fund's activities) can be obtained by calling DCF at: (613) 731-0493. The report details how DCF funds were raised and spent. Unfortunately, the name of one of DCF's key supporters, the Nova Scotia Dental Association, was omitted from the list of companies and associations who provided donations to DCF in 1994-95. DCF regrets this error and wishes to acknowledge the generous support it received from the NSDA. ■

isms as a result of a dental visit, there are at least two reported cases of immunocompromised patients in the United States who have developed nosocomial infections in this manner.

Because current strategies for cleaning dental unit water lines — such as flushing them with water for three minutes in between patients, or cleaning them with bactericidal solution — will not completely eliminate well-established biofilms, the water released from air-water syringes, high-speed handpieces and ultrasonic scalers may not be suitable for drinking.

Although various other strategies for cleaning dental unit water lines are being considered, CDA believes that dentists should take extra precautions when they provide dental treatment to immunocompromised individuals.

"Until the biofilm problem is resolved, however, and in known immunocompromised patients, the literature states that it may be appropriate to consult with the patient's physician and/or an infectious disease specialist to determine if antibiotic therapy is required. The use of rubber dam, and having the patient rinse with a 0.12 to a 0.2 per cent aqueous solution of chlorhexidine prior to initiating treatment, could help to reduce the bacterial aerosols that may precipitate infection in immunocompromised individuals. In fact, this therapy may be advisable for all patients," said CDA president James Brookfield in the letter.

There are currently no reported cases where disease transmission has occurred as a result of saliva ejector back flow, even though research conducted at the University of Alberta indicates that it may be possible for many illnesses, including hepatitis B, influenza, strep throat and chicken pox, to be spread in this manner.

"Dentists should be aware, however, that the risk of back flow from saliva ejectors may be greatly reduced if patients are always reminded not to close their lips around the ejector tip, especially when the high-volume evacuator (HVE) is being used at the same time. Closing the lips around the

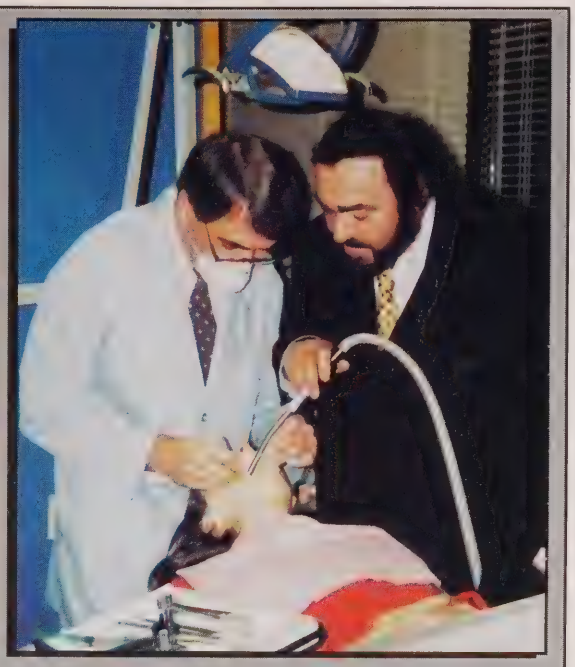
Singing In the Operatory?

Opera singing is not one of the qualifications British Columbia dentists usually look for when they hire a dental assistant, but don't tell that to Maestro Luciano Pavarotti.

The world-renowned opera star spent several hours during his recent visit to Vancouver "assisting" Dr. John Diggens in his downtown dental office.

It all began when Dr. and Mrs. Diggens attended a benefit dinner/concert in Vancouver where Pavarotti was the featured star. Part way through the evening, a call came out asking if there was a "dentist in the house." In good Samaritan fashion, Dr. Diggens, a certified endodontist and a member of CDA's executive council, rose from his seat and went backstage to find that Ms. Nicholetta Montevani, Maestro Pavarotti's companion, was suffering from toothache.

Ultimately, the evening was a total success. The benefit was over-subscribed, the patient was relieved of pain, and Dr. Diggens not only enjoyed a wonderful concert and dinner, but also met a real celebrity. And best of all, Pavarotti found out that when he can no longer earn a living as a tenor, he can always become a dental assistant. ■



Dr. John Diggens and his new dental "assistant," Maestro Luciano Pavarotti.

ejector tip, alone, can cause a decrease in vacuum line pressure, but doing so during the simultaneous use of the HVE may cause additional fluctuations in pressure. Further, evacuation lines should be rinsed and thoroughly disinfected following each patient appointment to reduce the risk of cross contamination," said Dr. Brookfield.

The dental unit water line and the saliva ejector issues are being closely monitored by CDA's committee on community and institutional dentistry. All relevant information, including the American Dental Association's recently-released statements on saliva ejectors and dental unit water lines, is also being scrutinized by CDA's planning and issues coordinating committee, and will be discussed at its next meeting.

"As always, it will be important to communicate openly with your patients, obtain an up-to-date medical history, and respond to their concerns in an open, honest manner," said Dr. Brookfield. "The key message should be that the risk of infection to healthy patients from dental unit water lines and saliva ejectors is minimal, and that the dental profession is working diligently to overcome these problems." ■

CDA and RRSP Alliance Call For Pension Equity

CDA and its partners in the Alliance For the Preservation of Retirement Savings are calling on Finance Minister Paul Martin to establish equity within the Canadian pension system, so that all Canadians "can live with dignity and in good health" in their later years.

"While we were initially encouraged by the government's decision to maintain the maximum registered retirement savings plan (RRSP) limit for 1995 at $14,500, we view the announcement to lower the maximum allowable annual contributions to $13,500 for both fiscal 1996 and 1997 as a setback to pension equity ...," said the chair of the alliance, Dr. Léo-Paul Landry, in a letter to the finance minister.

"While changes to reduce RRSP or registered pension plan (RRP) contribution limits might provide short-term tax revenue gain, they must be weighed against the grave long-term consequences associated with fewer private dollars available at the time of retirement, and increased reliance on the government for financial assistance ...

"Given that the government announced changes to RRSP contribution limits in last year's budget, we expect that it will honor that commitment and make no further ad hoc changes. Canadians need a greater degree of economic certainty and predictability in retirement planning. Continuous "unplanned changes" to the pension system will create an atmosphere of instability, further undermining Canadians' confidence in the pension system ...," wrote Dr. Landry. "The alliance wishes to underline that any major changes to the pension system without meaningful consultation with all interested parties would be totally unacceptable."

In his 1995 budget, Mr. Martin froze the allowable 1995 RRSP contribution limit at $14,500, and reduced limits for both 1996 and 1997 to $13,500. At the same time, the finance minister announced that limits would ultimately increase to $14,500 in 1998 and to $15,500 in 1999. From that point on, limits were to be indexed for inflation.

Mr. Martin's 1995 budget represented a set back to the retirement savings goals established by Brian Mulroney's Conservative government in 1989-90. The intent of these goals, which were based on a comprehensive review of the pension system, was to achieve equity

LIBRARY PACKAGE

This month's library package, or Search of the Month, is **DENTAL X-RAYS.** This package is available to CDA members for $5, plus applicable taxes. The CDA Library/Resource Centre, can be reached by telephone at: 1 (800) 267-6354 ext. 223; or by fax at: (613) 523-6574. We can even be accessed over the INTERNET at: cdalib@magi.com.

NEW VIDEOS

The following videos have been donated to the library collection by Dr. Sam Kucey, on behalf of the Canadian Association of Oral & Maxillofacial Surgeons.

1. *The retrognathic jaw.* Volume 1. The Orthognathic Video Library. CAOMS.
2. *The prognathic jaw.* Volume 2. The Orthognathic Video Library. CAOMS.
3. *Open bite/ maxillary excess.* Volume 3. The Orthognathic Video Library. CAOMS.
4. *Crooked jaw/ chin surgery.* Volume 4. The Orthognathic Video Library. CAOMS.
5. *Informed consent.* Volume 5. The Orthognathic Video Library. CAOMS.
6. *Nursing care for the jaw surgery patient.* The Orthognathic Video Library. CAOMS.

All videos are available to CDA members for a two-week loan period at a shipping/rental fee of $5, plus applicable taxes.

between money purchase arrangements, such as RRSPs, and defined benefit arrangements, such as defined benefit employer pension plans. The end result was a gradual phase-in of higher contribution limits for RRSPs, including a 1996 limit of $15,500, to ensure that these types of plans could ultimately provide retirement income comparable to what would be available through defined benefit arrangements.

CDA has been an active member of the 12-member alliance since its formation in September 1994, and has been a key player in the RRSP debate since the 1980s. ■

CDA's No-Tax Petition Well Received

More than 1,000 dental offices have returned completed no-tax petitions to CDA in support of dentistry's ongoing campaign against the taxation of employer-sponsored dental benefit plans.

Distributed to dentists in December, the petition calls on the federal government to "refrain from implementing a tax on health and dental benefits and to put on hold any future considerations of such a tax until a complete review of the tax system and how it impacts on the health of Canadians has been undertaken."

The completed surveys were to be presented to the government during the last week of February. Mr. Martin is expected to bring down his 1996 budget in early March. ■

OBITS

Charbonneau, Dr. Bruno: Died on November 28, 1995. Dr. Charbonneau received his dental degree from the University of Montreal's faculty of dentistry in 1934.

Gray, Dr. Peter: A graduate from the University of Toronto's faculty of dentistry in 1974, Dr. Gray from Barry's Bay, Ont. died suddenly on January 28 at the age of 45.

Hayhurst, Dr. Robert G.: A 1966 graduate from the University of Toronto's faculty of dentistry, Dr. Hayhurst, of Renfrew, Ont. died in October of 1995.

McManus, Dr. John E.: After graduating from the University of Detroit in 1960, Dr. McManus maintained a private practice in Woodstock, Ont. from 1963 until he retired in 1991. Dr. McManus was also a clinical instructor at the University of Western Ontario's faculty of dentistry for 18 years. He died on January 25.

Merchant, Dr. Brian P.: A graduate from the McGill University's faculty of dentistry in 1978, Dr. Merchant, of Outremont, Que., died January 10.

Mickiewicz, Dr. Maria E.: In Cambridge, Ont., on November 13, 1995. Dr. Mickiewicz graduated from the University of Western Ontario's faculty of dentistry in 1980.

Rouleau, Dr. Pierre: Graduated from the University of Montreal's faculty of dentistry in 1945, Dr. Rouleau, from Outremont, Que. died in October of last year.

Scott, Dr. Ronald E.: A graduate from the University of Toronto's faculty of dentistry in 1986, Dr. Scott passed away in October 1995.

Sim, Dr. James: Died November 14, 1995 in St. Catharines, Ont. Dr. Sim was a graduate of the faculty of dentistry, University of Toronto, 1950. He was in private practice in St. Catharines from 1950 to 1995. He was former associate of the department of oral medicine, faculty of dentistry, University of Toronto, and served as a flying instructor with the R.C.A.F. during World War II. Memorial donations to the James Sim Institute of Niagara College or the Hotel Dieu Hospital oncology clinic would be appreciated.

Ms. Diane Lachapelle Appointed Dean at Laval

Ms. Diane Lachapelle

Ms. Diane Lachapelle has been appointed dean of the faculty of dentistry at the University of Laval.

Ms. Lachapelle had served as interim dean since the death of Dr. Rolland Vallée in April 1995. She is the first non-dentist to be appointed as dean of a Canadian dental faculty, and only the second woman to hold the position. A 1974 graduate of the dental hygiene program at the University of Montreal, she holds a masters of science degree in dietetics from the University of Laval. ■

Dr. Barry Rayter Elected MDA President

Dr. Barry Rayter

Dr. Barry Rayter was elected president of the Manitoba Dental Association (MDA) January 18.

A general practitioner from Winnipeg, Dr. Rayter is a 1964 graduate of the faculty of dentistry, University of Manitoba. He has been chairperson of the MDA economics committee for 15 years and has been intimately involved in all aspects of government negotiations and third-party relations. In 1990 he was awarded the MDA president's award of merit for his outstanding service to Manitoba dentistry. He has been on the MDA board of directors since 1993 and served as vice-president in 1995.

Dr. Rayter was elected as MDA president during the association's 112th annual meeting, held at the Winnipeg Convention Centre January 18. It was the most successful annual meeting in MDA's history — more than 400 of Manitoba's 522 licensed dentists attended the three-day event.

Serving with Dr. Rayter on the MDA board of directors for 1996 are: Dr. Craig Fedorowich, vice-president; Dr. Tom Dobbs, past-president; Dr. Babette Cohen; Dr. Phil Poon; Dr. Murray White; Dr. Ed Yauck; Ms. Sylvia Moffat, appointee, government of Manitoba; and Ms. Deborah Paradoski, auxiliaries representative. ■

Federation Of Dental Societies Of Montreal Appoints 1996 Executive

The Federation of Dental Societies of Greater Montreal has appointed its executive for 1996. Dr. Joseph Szwimer will serve as the federation's president, with Drs. Sam Sgro, Jack Turkewicz, Sylvain Gagnon, Mike Percio, Lorne Wiseman, Joëlle Marcil, Jeff Erdan and Elise Shoghikian joining him on the executive committee.

The federation is comprised of the three largest Montreal dental societies — The Mount Royal-Alpha Omega Dental Society, The Montreal Dental Club and The Société Dentaire de Montréal — and has a combined total membership of over 900 dentists. It is responsible for organizing scientific continuing education programs for the greater Montreal region. ■

Thunder Bay Dentist Commands National Defense Reserve Medical Company

Captain Dean P. Gresko receives unit sword of command from Navy Lieutenant Ian D. Sweet in Thunder Bay.

When Dr. Dean Gresko of Thunder Bay, Ontario, was appointed to command the 18th Thunder Bay Medical Company last fall, he became the first dental officer in Canada to assume the commanding office of a reserve medical company.

Dr. Gresko first became associated with the military as an air cadet at the age of 14. In 1981 he enroled in the Thunder Bay 18th Service Battalion, and in 1985 he obtained his commission as officer cadet and transferred to the 18th Medical Company. Three years later, in 1988, he took leave of absence to attend the Minnesota School of Dentistry, obtaining his DDS in 1992. He currently practises in Thunder Bay. ■

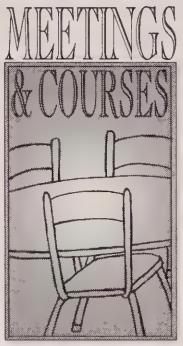
Winnipeg Dentist Elected CAP President

Dr. David Singer

Dr. David Singer of Winnipeg, Manitoba, has been elected as president of the Canadian Academy of Periodontology (CAP).

A 1964 graduate of the University of Alberta's faculty of dentistry, Dr. Singer was awarded both certification in periodontics and a PhD in oral biology from the University of Manitoba in 1973. He is currently head of the department of diagnostic and surgical sciences, faculty of dentistry, at the University of Manitoba.

Dr. Singer will be joined on the CAP executive council by: Drs. Marlene Mader, president-elect (St. Catharines, Ont.); Patrick Pierce, secretary-editor (Edmonton, Alta.); David Tisch, treasurer (Barrie, Ont.); Roger Issa (Montreal, Que.); and Michel Couture, past-president (Montreal, Que.). ■



INTERNATIONAL

May 5-8

5th Congress Of The International Society for Lasers In Dentistry in Jerusalem, Israel. Contact the ISLD, P.O. Box 50006, Tel Aviv, 61500, Israel. Tel.: 972 3 5140000, or fax: 972 3 5174674 or 972 3 5140077.

May 16-18

British Dental Association Conference in Edinburgh. Contact the British Dental Association, Conference Office, 64 Wimpole St., London W1M 9AL. Tel.: 0171 935 0875, or fax: 0171 486 0855.

May 30 — June 1

Satellite Program '96 — Contemporary Gnathology in The Hague, Netherlands. Co-sponsored by the American Equilibration Society and the Dutch Society for Gnathology. Contact the American Equilibration Society, 9726 North Ferris Ave., Morton Grove, Ill. 60053, U.S.A. Tel.: (708) 965-2888, or fax: (708) 965-4888.

June 18-22

Turkish Dental Association's 3rd International Dental Congress in Ankara, Turkey. Tel: 0 312 479 8924, or fax: 0 312 474 79 25.

July 11-13

International Women's Dental Conference in Melbourne, Australia. "Enhancing the balance both personally and professionally." Contact Amanda Lawrence, 3 Railway Walk, Hampton 31188, Australia. Tel.: (03) 9521 6500, or fax: (03) 9521 6501.

August 10-16

43rd World Congress of Young Dentists Worldwide (YDW) and International Association of Dental Students (IADS) in Göteborg, Sweden. Contact the IADS & YDW Congress Committee, Odontologen, Medicinaregatan 12 a, 8, 413 90 Göteborg, Sweden. Tel.: +46(0)31 773 32 08, or fax: +46(0)31 773 32 07.

August 19-23

21st North Queensland Dental Convention in Cairns, Australia. Contact Peter Martin, North Queensland Dental Convention, P.O. Box 388, Cairns 4870, Australia. Tel.: (070) 51 2351, or fax: (070) 31 2351.

CANADA

April 13

Participation Course in Local Anesthesia — An Opportunity To Completely Control Operative Dental Pain. Presenters: Dr. J. Mel Hawkins and Dr. David Isen. Contact the Ontario Dental Association, Professional Development, 4 New St., Toronto, Ont. M5R 1P6. Tel.: 1-800-387-1393, or fax: (416) 922-9005.

April 16

Review of Analgesics in Dentistry. Presenter: Dr. W.C. Foong. Contact Continuing Education, Faculty of Dentistry, Dalhousie University, Halifax, N.S. B3H 3J5. Tel.: (902) 494-1674, or fax: (902) 494-2527.

April 18

Emergency Procedures In The Dental Practice — Dr. Earle Young. Contact Continuing Dental Education, Faculty of Dentistry, University of Toronto. Tel.: (416) 979-4902, ext. 4503 or 4590, or fax: (416) 979-4941.

April 22

The George C. Hare Lecture in Endodontics. Guest speaker: Dr. Gunnar Bergenholtz from Göteborg, Sweden. Registration will be limited to the first 120 persons. Contact Continuing Dental Education, Faculty of Dentistry, University of Toronto. Tel.: (416) 979-4902 ext.: 4503, or 4590, or fax (416) 979-4941.

April 27

Review and Update in Medicine. Contact Continuing Education, Faculty of Dentistry, Dalhousie University, Halifax, N.S. B3H 3J5. Tel.: (902) 494-1674, or fax: (902) 494-2527.

April 27

Innovations In Clinical Dentistry: New Directions For the 21st Century — Howard Strassler, DMD. Contact Darcy Duggan, University of Manitoba. Tel.: (204) 789-7331, or fax (204) 888-4113.

May 2

The University of Toronto Class of 1986 — 10-year reunion. Contact Dr. Iris Kivity-Chandler. Tel.: (416) 787-9060, or fax: (416) 709-3905.

May 4

An Overview of Forensic Dentistry. Presenter: Dr. David Sweet. Contact Continuing Education, Faculty of Dentistry, Dalhousie University, Halifax, N.S. B3H 3J5. Tel.: (902) 494-1674, or fax: (902) 494-2527.

May 10-11

Joint meeting of the **Canadian Academy of Periodontology (CAP)** and the **Association of Prosthodontists of Canada (APC)** in Montreal, Que. Contact Dr. Don Kramer (APC), tel.: (416) 597-0839; or Dr. Lorne Wiseman (CAP), tel.: (514) 937-3535.

May 11

Northern Alberta Dental Hygienists Society in Edmonton — Emergency Medicine in Dentistry. Guest speaker: Dr. Stanley Malamed. Contact Glennis or Patricia McIntyre. Tel.: (403) 465-1756, or fax: (403) 440-0554.

May 11

Pediatric Dentistry, 1996: A Renaissance. Presenter: Dr. Theodore Croll. Contact Continuing Education, Faculty of Dentistry, Dalhousie University, Halifax, N.S. B3H 3J5. Tel.: (902) 494-1674, or fax: (902) 494-2527.

June 6-8

University of Toronto's faculty of dentistry — Root Canal Filling by Vertical Condensation of Warm Gutta-Percha. Contact Continuing Education, Faculty of Dentistry, University of Toronto, 124 Edward St., Toronto, Ont. M5G 1G6. Tel.: (416) 979-4902, ext.: 4389.

June 7-9

Canadian Dental Hygienists' Association 7th Annual Professional Conference — "Interdependence and Independence: Striking a Balance." Contact Janice Edgar. Tel.: (613) 221-5515, or fax (613) 224-7283.

July 6

HIV Prevention Works — a satellite symposium of the XI International Conference on AIDS in Vancouver, B.C. Contact the Canadian Public Health Association, 400-1565 Carling Ave., Ottawa, Ont. K1Z 8R1. Tel.: (613) 725-3769, or fax: (613) 725-9826.

July 23-26

8th International Congress of the International Association of Oral Pathologists in Toronto. Contact the Congress Office, P.O. Box 1570, 190 Railway St., Kingston, Ont. K6L 5C8.

August 17-20

Canadian Dental Association 1996 Convention in Montreal. Scientific sessions, exhibit hall, social events, special activities, spouse's program and children's program. Contact Laura Stephenson. Tel.: (613) 523-1770, ext. 246, 1-800-267-6354, or fax: (613) 523-3062.

August 17-20

Annual Convocation and Meeting of the Canadian Section of the International College of Dentists in Montreal, Que. Contact the Canadian Section of ICD, 12A Yonge Blvd., Suite 1, Toronto, Ont. M5M 3G5.

August 17-22

8th World Congress on Pain in Vancouver, B.C. Sponsored by the International Association for the Study for Pain (IASP). Contact the IASP Secretariat, 909 N.E. 43rd St., Suite 306, Seattle, Wash. 98105, U.S.A. Tel.: (206) 547-6409, or fax: (206) 547-1703.

U.S.A.

April 12-13

31st Boucher Prosthodontic Conference in Columbus, Ohio. Internationally respected speakers on all aspects of prosthodontics. Contact Dr. Robert Stevenson at (614) 451-2767.

April 14-16

Minnesota Dental Association's 113th Star of the North Meeting. Contact the Minnesota Dental Association, 2236 Marshall Ave., St. Paul, Minn. 55104. Tel.: (612) 646-7454, or fax: (612) 646-8246.

April 19-20

8th Annual National Conference on Special Care Issues in Dentistry in Chicago, Ill. A conference of more than 300 researchers, clinicians, institutional directors, pre- and post-doctoral dental students, dental society staff and other individuals interested in special care issues. Contact the Federation of Special Care Organizations in Dentistry, 211 E. Chicago Ave., Suite 948, Chicago, Ill. 60611. Tel.: (312) 440-1660.

May 3-4

15th Annual Academy for Sports Dentistry Symposium in Minneapolis, Minnesota. Featuring orofacial trauma and hands-on mouthguard fabrication workshop. Contact the University of Minnesota, Continuing Dental Education, 6-506 Moos HS Tower, 515 Delaware St. S.E., Minneapolis, Minn. 55455. Tel.: (612) 625-1418.

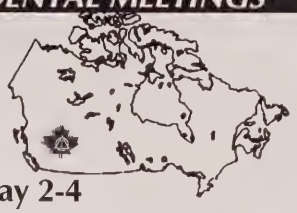
June 13-16

1996 Annual Symposium of the Office Sterilization and Asepsis Procedures (OSAO) Research Foundation in Dallas, Texas. Contact the OSAP Central Office, P.O. Box 6297, Annapolis, Md. 21401. Tel.: (410) 798-5665 or 1-800-298-6727, or fax: (410) 798-6797.

July 25-27

10th National Conference on the Young Dentist — A Decade of Excellence, in Cleveland, Ohio. Contact the American Dental Association Committee on the New Dentist. Tel.: (312) 440-2779.

DENTAL MEETINGS



May 2-4

Ontario Dental Association Annual Spring Meeting in Toronto. Contact Diana Thorneycroft. Tel.: (416) 922-3900, ext. 346, or fax: (416) 922-9005.

May 9-11

Newfoundland Dental Association Annual Meeting in Cornerbrook. Tel.: (709) 579-2362.

May 23-25

Prince Edward Island Dental Association Annual Meeting in Mill River. Contact Dr. Cheryl Wenn. Tel.: (902) 628-8088.

May 25-29

25e Congrès annuel de l'Ordre des dentistes du Québec — Les Journées dentaires in Montreal. Contact Nicole Pagé or Ginette Boutin. Tel.: (514) 875-8511, or fax: (514) 875-1561.

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New Brunswick Dental Society Annual Meeting in St. Andrews. Tel.: (506) 452-8578.

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Annual Meeting of the CDA Board of Governors, in Montreal. Contact Suzanne Burton. Tel. (613) 523-1770, ext. 201, or 1-800-267-6354.

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Protection and Prevention: A Two-Way Approach To Office Insurance

It takes just one look at the claims statistics for the Canadian Dentists' Insurance Program's TripleGuard plan to understand how important office insurance is to the dental profession. In 1995, about $3 million was paid out in office insurance claims. And in the last three years, there has been an average of more than one office contents claim every day, three practice interruption claims every week, and one general liability claim every five days.

Generally, office contents claims stem from damaged or stolen items. Practice interruption claims are for fixed expenses and lost income when such incidents as fire, theft or water damage prevent you from practising. Comprehensive general liability claims are for legal costs and settlements if personal injury to others or damage to third party property results from your practice.

Virtually every year, about one in 10 dentists has an office insurance claim. Which means that over a period of a few years, the likelihood that you'll experience an office mishap leading to a claim is — unfortunately — rather high.

This leads to two needs: the need for proper insurance coverage, and the need to minimize the chance of office mishaps by taking loss prevention measures.

Practise Loss Prevention

Of course, not all claims can be avoided, but dentists can minimize the chance of experiencing loss or damage by taking a few simple precautions. Most dental office claims result from fire, theft or water damage.

If you have a sprinkler system, make sure it's supplied with enough water and water pressure to reach areas where fire may start. Keep a fire extinguisher in the office and make sure it's inspected and fully charged. (TripleGuard pays the expense of recharging your extinguisher after it's been used to fight a fire.)

To discourage theft, keep computer software, laptops, printers and other portable computer equipment out of sight. Also, don't keep large supplies of drugs and precious metals on hand, and lock up these supplies when you leave the office. To help prevent theft, install good quality locks, doors and windows, and make sure all doors and windows are locked every night. It's also a good idea to have a burglar alarm that's connected to a central monitoring station. And make sure you're aware of how much of your office space is actually protected by your alarm system.

To avoid water leaks, install automatic shut-off switches on all your dental units to interrupt the water supply after hours. Many practices designate someone to check all water sources at the end of each day (and take extra precautions before weekends and vacations). Also, check your ceiling tiles for stains — they're a possible sign of a water leak above.

Avoiding water leaks is also an important loss prevention measure for comprehensive general liability, since water damage to another office can result in legal action. Another way to prevent liability claims is to make sure your coat rack isn't near the door, so patients are less likely to have personal items stolen. Also, always ensure that snow and ice are promptly cleared from steps and walks, and make sure stairways have secure handrails, to prevent slips and falls (when these responsibilities are under your control, of course).

Other precautions and procedures will come to mind when you make it a habit to think in terms of loss prevention. The result will be fewer claims, which will save you practice headaches. For the profession overall, fewer claims means reducing the chance of increased TripleGuard premiums in the future.

In many cases, even when a loss cannot be avoided — despite your best efforts — you can at least minimize its effects by taking some basic precautionary steps beforehand. For example, by regularly copying your patient files, records and accounts receivable, and storing the copies off-site, you'll protect yourself in the event that those materials are ever damaged or destroyed. It's also a good idea to take, and store off-site, either a video recording or photographs of everything in your office. If loss ever occurs, this record will make the claims process easier. It may also be helpful to make arrangements in advance — perhaps with another dental practice — that would enable you to carry on your practice, and reduce lost income, if theft, fire or water damage prevents you from using your own office.

Custom-Tailor Your Protection

In the TripleGuard plan, the amount of your insurance hinges on office contents, because the ba-

sic plan has set coverage amounts for the other two components — practice interruption and comprehensive general liability.

Remember that office contents include practically everything, even outdoor signs, personal effects, full computer systems and software. Use CDSPI's Office Inventory and Valuation Form to ensure that everything's covered. And when you make a purchase, add it to the list that day. Also, keeping copies of invoices off premises (and possibly keeping a list of suppliers for each item) can save you a lot of phoning around later.

Sometimes dentists fail to insure their office contents for the full replacement value. You should review your coverage annually and increase it if equipment costs have increased. A dental supply representative can help you determine your equipment and supply replacement costs.

If you do have a claim, it's important to remember that under TripleGuard the insurer pays for repair or replacement. Or you can choose to be reimbursed for an item's depreciated value. If, for example, a computer was stolen, the plan would pay for its replacement value — not for a computer upgrade. There is one exception to this rule: if the model of the item to be replaced is no longer manufactured, then the insurer pays for the next model up.

TripleGuard is designed so that dentists don't pay extra amounts for coverage they don't need. The basic plan provides mandatory coverage that all dentists require, and dentists can purchase extended coverage in specific areas to fine-tune the plan to their own practice situation. About four out of 10 dentists choose extended coverage.

You can choose extra coverage for the following office contents areas (TripleGuard already provides $15,000 basic coverage in each area):

- *Valuable papers* covers reconstruction of damaged or stolen papers, files and patient records.
- *Money, securities and precious metals* covers all materials described by these three items, except for amalgam.
- *Additional lease expense* covers the difference if office damage forces you to leave the premises

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	CDA	Other*	CDA	Other*	CDA	Other*	CDA	Other*
Aggressive Equity	**14.8%**	28.3%	n/a		n/a		n/a	
Common Stock	**19.5%**	22.2%	**14.0%**	14.6%	✔ **11.2%**	11.2%	✔ **9.9%**	8.4%
Balanced	**19.5%**	20.0%	**10.7%**	12.0%	**10.4%**	10.8%	✔ **9.5%**	8.6%
Bond & Mortgage	✔ **19.3%**	19.0%	✔ **9.7%**	9.1%	✔ **11.0%**	10.4%	✔ **10.5%**	10.2%
Money Market	✔ **7.3%**	6.3%	✔ **5.7%**	5.0%	✔ **6.5%**	6.0%	✔ **8.3%**	7.9%
International Equity	✔ **21.7%**	16.3%	n/a		n/a		n/a	
European	**15.3%**	15.4%	n/a		n/a		n/a	
Pacific Basin	✔ **26.4%**	12.1%	n/a		n/a		n/a	
Emerging Markets	**6.9%**	10.2%	n/a		n/a		n/a	

† *CDA figures indicate annual compound rate of return with all fees deducted. The figures are historic rates based on past performance and are not necessarily indicative of future performance.*

* *Comparison performance figures are Globe and Mail averages for the range of similar funds offered in the marketplace before sales charges, as published in the February 15, 1996 issue.*

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CDSPI

and pay a higher monthly rate elsewhere.

- *Accounts receivable* covers reconstruction of records, uncollectible accounts and collection procedures if your accounts receivable records are destroyed or stolen. (More than one in four dentists choose this additional coverage. Your accountant can help determine the coverage amount you need.)
- *Rental value* covers your office rent if restoration keeps you from practising.
- *Extra expenses* covers extra costs involved in continuing your dental practice while your office is being restored.
- *Employee dishonesty* covers losses caused by staff, including forgery.

Another way to customize your office insurance under TripleGuard is by choosing the equipment breakdown option. It covers repair or replacement of equipment that breaks down — such as patient chairs and X-ray equipment — and in certain situations the resulting lost income. (Equipment must be maintained according to manufacturer's recommendations and be inspected at least once a year.)

There is no need to customize your practice interruption coverage, since TripleGuard provides unlimited coverage. You can, however, purchase extra comprehensive general liability coverage. TripleGuard provides $2 million of liability coverage, and you can purchase $1 million, $2 million or $3 million of extra coverage.

The two-way approach — protecting yourself with complete insurance coverage and taking the right loss prevention measures — is vital to effective practice management. There aren't many professions that demand the significant investment in office equipment that is required in dentistry. And there aren't many professions that suffer such heavy losses of income if water damage or fire make the office temporarily unusable. So make sure that you are totally satisfied with both aspects of your office insurance program — protection and prevention. ■

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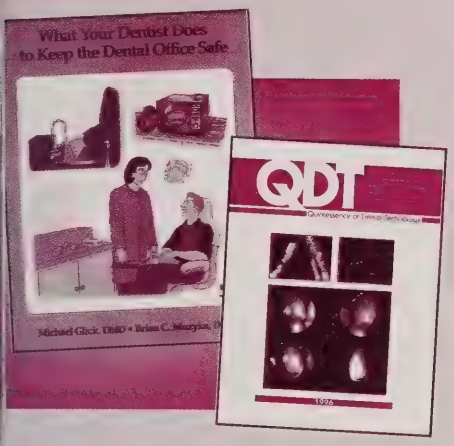

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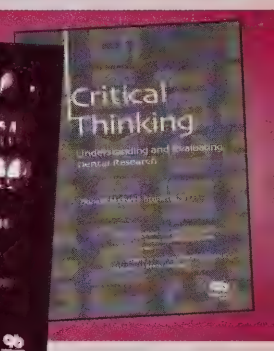

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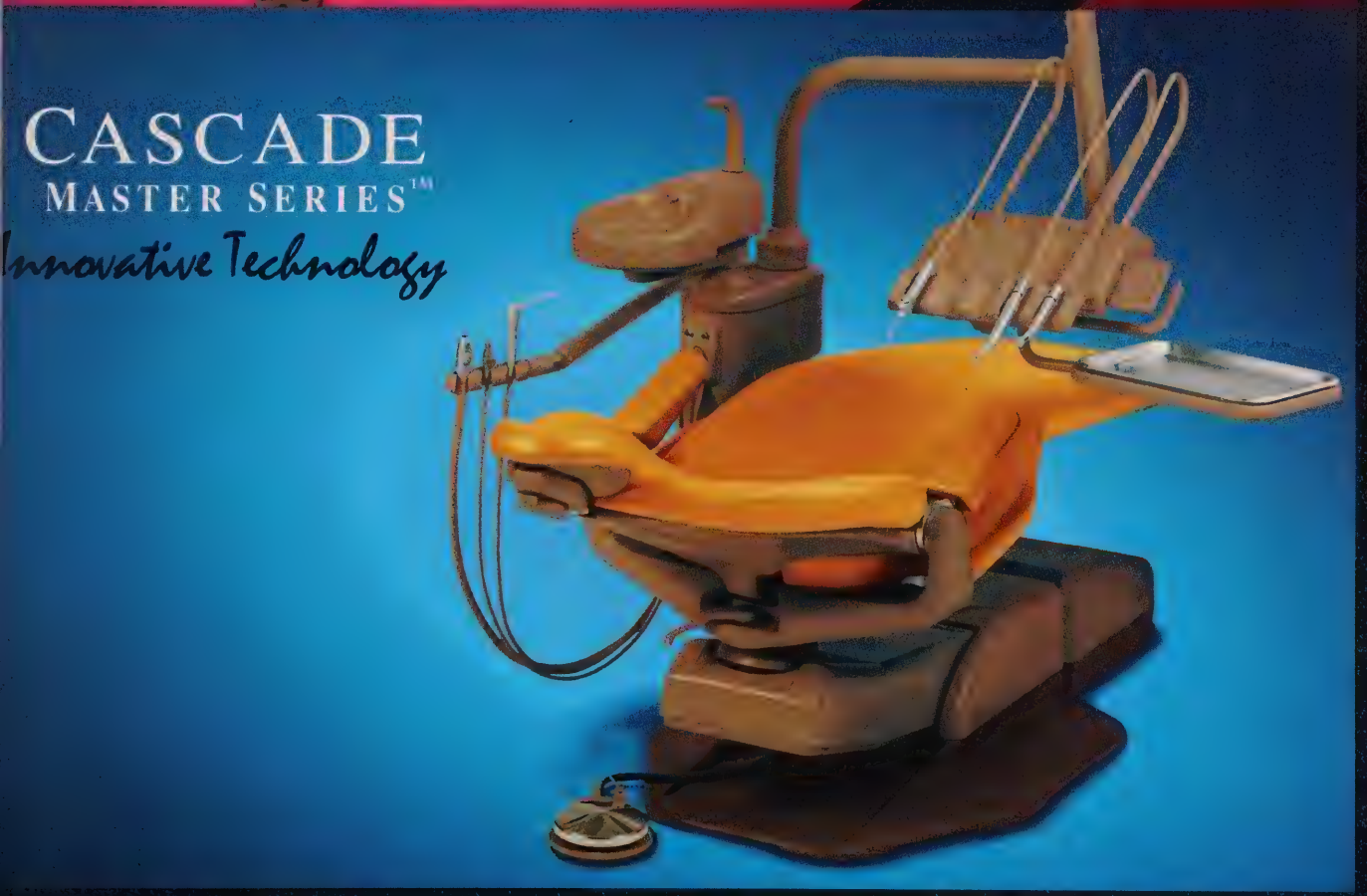

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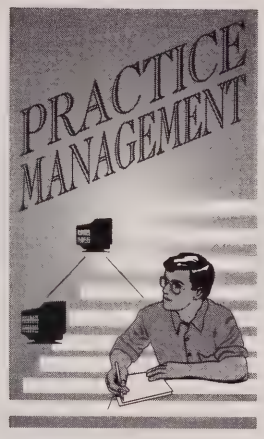

The Power Of Your Vocal Image

Lee Ann McCoy, BA, B.Ed., M.Ed.

ABSTRACT

Your vocal image is the impression that listeners form of you based on the sound of your voice. In a dental office, where the initial patient contact usually occurs over the phone, your vocal image is vitally important. According to social psychologists, people begin to make relatively durable first impressions within six to 12 seconds of perceiving a sensory cue. This means that patients begin to form their impressions of a telephone speaker almost immediately. Based on the qualities of the speaker's voice and how it is used, they'll form impressions related to everything from the speaker's physical and personality characteristics to his or her intellectual ability, and eventually even generalize their impressions to include the office that the speaker represents.

If you want to improve your vocal image, you must first be aware of exactly what that image is. There are two factors that combine to create a vocal impression — the speaker's physical vocal tools and the sound that is created by them. The five physical tools involved are the lungs, vocal cords, throat, mouth and ears. At each stage in the sound production process, we can easily fall into negative habits and lazy patterns if we're not careful. Although we can't do much about our physical voice mechanism, we can certainly exercise a great deal of control over how our voice is used. A strong, confident voice is an essential part of effective interpersonal communication. If you want to project an image of confidence and professionalism, don't overlook the subtle benefits of effective vocal power.

SOMMAIRE

Votre image vocale est l'impression que ceux qui vous écoutent se forment en entendant votre voix. Dans un cabinet de dentiste, où le premier contact avec un patient se fait ordinairement par téléphone, l'image vocale est extrêmement importante. Selon les psychologues sociaux, les gens commencent à avoir des impressions relativement durables en six à douze secondes après avoir capté des signaux sensoriels. Autrement dit, les patients commencent à se former des impressions presque immédiatement lorsqu'une personne leur parle au téléphone. Suivant les caractéristiques vocales de cette personne et la manière dont elle les utilise, ils se forment des impressions sur tout à son sujet, allant de ses traits physiques et de personnalité à ses aptitudes intellectuelles. Éventuellement, ils généralisent même ces impressions à tout le cabinet que la personne représente.

Si vous désirez améliorer votre image vocale, vous devez d'abord bien connaître la vôtre. Il y a deux facteurs qui s'allient pour créer une impression vocale: les outils vocaux physiques de la personne qui parle et le son créé par ces outils. Ceux-ci sont au nombre de cinq: les poumons, les cordes vocales, la gorge, la bouche et les oreilles. À chaque étape dans la production des sons, on peut facilement, si on ne fait pas attention, tomber dans de mauvaises habitudes et la paresse. Bien qu'on ne puisse faire grand-chose au sujet du mécanisme vocal physique, on peut sûrement faire preuve de maîtrise touchant la façon dont on utilise sa voix. Une voix forte et assurée est essentielle pour bien communiquer avec autrui. Si vous désirez projeter une image inspirant confiance et professionnalisme, ne négligez pas les subtils avantages que confèrent de bons pouvoirs vocaux.

Introduction

What kind of image do people conjure up when they speak to you on the phone? Do they picture you as someone tall, short, dark or fair? Do they picture you as confident and organized? Do they perceive you to be friendly or aloof? Or is it crazy to think that they picture anything at all? Remember, we are talking about an image that is based solely on the sound of your voice.

These are not meaningless speculations. They are issues of importance to all organizations that conduct at least part of their business over the phone. In a dental office, for example, your receptionist's vocal impression is often the first cue that a patient or potential patient has to make an impression of you and your organization. Believe it or not, your receptionist can make or break that patient relationship with his or her voice, even before you have an opportunity to make an impression on the patient yourself.

In today's competitive market, it isn't enough to have the technological edge. What separates an adequate dental office from a superior one is something less tangible and less quantifiable: the relationships with the patients. If an office prizes knowledge and skill over communication, it is doing itself and its patients a disservice. Your knowledge and skill are only as good as your ability to communicate. If you can't connect with your patients, you aren't going to get them into the office. Contrary to what many people believe, building a bond with your patients does not begin when they first present themselves in your office. It actually begins the first time they telephone your office.

Impression Formation

As human beings, we continually engage in a purely subjective, mostly subconscious psychological process known as impression formation. Social psychologists have suggested that relatively durable first impressions are formed within six to 12 seconds of perceiving a sensory cue. In any face-to-face interpersonal encounter, we immediately begin to form impressions based on certain static cues (such as weight, height, hair color, and clothing) and dynamic cues (such as facial expression, body language, voice, and language). Although there are certain cues over which we have very little personal control, there are many areas where we can make changes to ensure that the image we project is perceived as positively and professionally as possible.

Your voice and how you use it can be controlled to project a favorable impression, for example. Within seconds of hearing the tone and quality of your voice, not to mention the words you choose and how you say them, your listener has begun to make inferences about you. These inferences can include assumptions about your physical appearance, personality characteristics, and intellectual level, and are often generalized to include the office you represent. Even though these assumptions are often incorrect, they can't be dismissed, as they help to create that memorable first impression.

First impressions may not have received the respect they deserve, possibly because their formation seems to defy logic. We must remember, however, that this process is largely out of our conscious control. We are really only the recipients of the impressions formed in our subconscious. If we were consciously able to subject this process to some form of rational analysis, we would undoubtedly eliminate unsupported inferences and wait for sufficient cues before we made impressions. However, this is not how the mind processes information.

How do we know what impressions to form? Well, most of our impressions grow out of our own life experience. They are learned responses, in other words. We learn to associate a powerful, deep male voice with positive qualities like strength and confidence. On the other hand, a very high, breathy female voice seems frivolous and flighty. Consider, for example, how we characterize men with high voices, or how the pitch of our voice often rises when we speak to children to make it sound softer, or how we speak more loudly and tend to use shorter sentences when we're angry. These are all learned responses that eventually become so automatic that we never think about them.

Without even realizing it, you may have adopted certain vocal patterns and styles that are sending out the wrong signals to your listeners. If these signals lead to the creation of a negative image, then you need to be aware of what you can do to change this image.

Physical Stages Of Vocal Production

Before sound leaves your mouth, it proceeds through five physical stages: the lungs generate air, the vocal cords vibrate, the throat assists in resonation, the mouth articulates and the ears evaluate the final product. At each of these five stages, our physiology plays a large role in our vocal response. We can't change this. However, many of us are guilty of lazy habits that may interfere with how we use our physical vocal tools to produce effective communication.

Air Generation

The first stage of vocal production involves generating sufficient air from the lungs to carry the voice. If you have a soft voice or a voice that tends to waiver mid-sentence, you may be using inefficient breathing techniques. Try this exercise: Place one hand on your belly and the other hand on your chest and take four or five normal breaths. If your chest moves more than your belly, then you are a chest heaver. Chest heaving is superficial breathing that rarely generates sufficient air for vocal power. You can overcome the habit of chest heaving by practising belly breathing. Through deep belly breathing, you will be able to generate enough air to speak for longer periods of time between breaths. Women who have to stop and breathe after short phrases project a breathless, Marilyn Monroe-type image that does not convey professionalism. Men who have to breathe between phrases often sound somewhat exasperated and short-tempered. When you use your lungs effectively to project a strong voice, you tend to project control and confidence.

Vibration Of Vocal Cords

The vibration of the vocal cords creates the sound of your voice. Although there are certain physi-

ological limitations on the control we can exercise over our vocal cords, we sometimes inadvertently do things to hurt them. Hoarseness can result from activities such as smoking, excessive whispering, and prolonged screaming. Avoiding situations that can hurt your vocal cords will ensure that your vocal quality is as positive as you can make it.

The size of our vocal cords physically predisposes us to speak at a certain pitch — our so-called optimum pitch. Some people have fallen into the habit of speaking either higher or lower than their optimum pitch. This level is called their habitual pitch. If your habitual pitch is sufficiently different from your optimum pitch, you could be hurting your vocal cords.

One way to determine your optimum pitch is to do this exercise. Say "Mmmm hmmm" several times. Place one hand on your throat and the other hand across the bridge of your nose. Feel the vibrations of the sound. Then say "Mmmm hmmm — yes" several times. Make sure that when you say "yes" you are feeling the same vibrations as when you said "Mmmm hmmm." If you don't feel the same vibrations, then modify the word "yes" until you do. Practice speaking so you feel the same vibrations as you did during the "Mmmm hmmm" exercise.

Resonation

The resonation of vibrating vocal cords takes place primarily in the throat and nasal cavity. However, if you let too much of the resonation take place in the nasal cavity, then your vocal quality will likely have too much nasality in it. Sometimes, our physiological structure is such that we have little control over this fact. However, many people with nasality in their voices have simply developed the habit of letting the sound resonate upward instead of forward. One way to test for nasality is to plug your nose and say these two sentences: "The red car sped across the city street;" and "My brown van broke down on Monday." The second sentence should be impossible to say clearly, while you should have no problem saying the first. If you detect some nasality in the first sentence, practice repeating pairs of words such as neat-beat, now-cow, mike-bike, near-fear, pen-pod, making sure to eliminate the nasal resonation in the second word.

Articulation

Articulation is one area of voice production that is largely under our control. Articulators include the lips, tongue, jaw, hard palate, and soft palate. Many people allow the resonated sound of the voice to tumble out of the mouth in a mumbled, mushy mess. When we take the time to use our articulators fully and correctly, however, we give the impression of someone who is precise and professional. Exercise your articulators by stretching your tongue as far down on your chin as it will go and then lifting it up toward the tip of your nose. Smile the widest smile you can. Try this exercise: Say, "How are you today?" with a frown on your face. Now say it again with a smile. You'll see that a smile can't help but have a vocal effect.

Evaluation

Conducting an ongoing evaluation of your vocal process is rather difficult. We never hear our own voices as others hear them, partly for physical reasons: the resonation process distorts the sound of our voice. We also tend to hear others, but not listen to ourselves, in everyday conversation. We tune in to the verbal messages of others, but we rarely listen to the quality of our own verbal message. If you really want to improve your vocal skills, however, then it is crucial to listen to your voice. A good technique to help in vocal self-analysis is to audiotape your voice and play it back, listening for specific things. Most of us balk at hearing our voice on tape, saying, "I don't think I really sound like that." In fact, how you sound on tape is probably much closer to how others hear your voice when you speak than how you hear it yourself.

Functional Vocal Skills

Once you have analyzed the physical mechanisms that contribute to your vocal image, you can then turn your attention to how you use your voice. The five main functional vocal skills include quality, range, enunciation, pronunciation, and pacing.

Your vocal quality depends on two major factors: your physical mechanism and your emotional situation. Although you can't do much about your physical vocal characteristics, you can improve vocal quality by deep belly breathing, speaking at your optimum pitch, trying to position resonation in the front part of your mouth, and articulating clearly. If you have a voice that carries emotion, the first step is to be aware of it. If you are depressed, your voice will lack enthusiasm. If you are nervous or tense, your voice will sound strained, thin, and reedy. If you are angry, your voice will usually be louder, more abrasive, and you will generally speak with shorter sentences. Monitoring your emotional state allows you to be aware of the effect it may have on your voice. If you know that you are tired or frustrated, for example, you have to work a bit harder to ensure that your emotional state doesn't come across in your voice.

Vocal Range

Vocal range refers to your use of intonation and pitch. Do you speak with some intonational variety? Does your voice rise and fall at appropriate places in the sentence, or do you have a fairly monotone vocal presentation? A falling inflection at the end of a sentence usually makes a definite statement. It conveys a speaker's confidence. Too many falling inflections, however, can suggest arrogance or a know-it-all attitude.

A vocal problem that is more common in women is rising inflections at the end of what should be statements. A rising inflection usually indicates a question. However, if it's used at the end of a statement, it suggests that the speaker is looking for affirmation.

It conveys an image of someone who is unsure of what is being said.

Enunciation and Pronunciation

Enunciation and pronunciation go hand in hand. When you enunciate clearly, you are using your articulators fully and correctly. However, it's possible to enunciate clearly, yet pronounce incorrectly. For example, how do you say "mischievous"? If you clearly said "miss-chee-vee-us," then you were enunciating correctly, yet pronouncing incorrectly. The word has only three syllables: miss-chi-vus. Check your dictionary for the pronunciation of any word that you are unsure of. A mispronounced word can have a serious effect on credibility in certain situations. For example, if you are unsure of how to pronounce a name, always ask. People who frequently have their names mispronounced may come to expect it, yet it is always annoying and sometimes even insulting. On the other hand, when someone cares enough to ask before making an assumption about pronunciation, it shows respect.

Practising tongue twisters will strengthen lazy articulators. Start by saying the tongue twister slowly and clearly, then speed up until you are still enunciating clearly, but your articulators are working double time. You'll find that a small amount of practice yields a tremendous improvement when it comes to clear speaking.

Vocal Pacing

How fast you speak is also a key part of your vocal image. If you speak quickly, then you likely have a tendency to speak abruptly. This creates the impression of someone who is in a hurry. On the phone, you may give your listeners the impression that they have interrupted you or that you don't really have enough time to speak with them. Conversely, vocal pacing that is too slow gives a lethargic, apathetic impression. You sound sluggish and dull. Occasionally, people will demonstrate inconsistent pacing — racing at some points, but drawing out pauses in others. Some pacing variety is essential, but extremes are distracting. Ask for feedback from family and friends to determine if this is an area that needs attention.

One common pacing problem that plagues many of us is the use of word whiskers. These are the non-specific vocal sounds, like ummm and ahhh, that we sometimes use to fill in space when we need more time to think or to organize our thoughts. However, learning to pause, rather than to reach for a word whisker, takes practice. It requires that you become comfortable with what sometimes seems like an unending silence. Pausing between thoughts, however, creates a much more professional image than filling those pauses with meaningless verbal sounds.

Conclusion

When Marshall McLuhan said that the medium is the message, he wasn't referring to the voice, but he could have been. How you say something is often more important, and more powerful, than what you actually say. So if you want your patients to feel comfortable, to feel confident about you and positive toward the office you represent, don't ignore your vocal impression. It's a small part of your interpersonal communication skills, yet it's an area that yields tremendous power. Make sure that vocal power is working for you and not against you. After all, taking the time to monitor and perhaps modify your vocal impression, and asking your receptionist to do so as well, can save you the trouble of having to undo a negative first impression. That's assuming, of course, that you get the chance. ■

Ms. Lee Ann McCoy is a professor of English/communications at Algonquin College, and a consultant with Lynne Mackay Image Consulting, in Ottawa, Ontario.

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AUGUST 17 - 20 • **Montréal 1996** • DU 17 AU 20 AOÛT

CANADIAN DENTAL ASSOCIATION CONVENTION / CONGRÈS DE L'ASSOCIATION DENTAIRE CANADIENNE

Introducing ....the Members of the CDA 1996 Organizing Committee

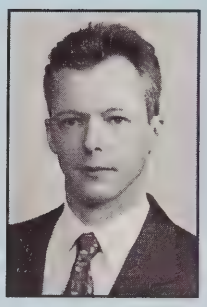
Dr. Michel Jahjah

Dr. Micheline Blain

Dr. Sylvain Gagnon

Dr. Sylvain Laforte

Dr. Sam Sgro


Dr. Joseph Szwimer

The CDA 1996 Convention will take place in the beautiful city of Montréal from Saturday, August 17 - Tuesday, August 20. This meeting will be held in the Montréal Bonaventure Hilton and Place Bonaventure Exhibit Halls as well as in surrounding hotels.

We are pleased to mail the preliminary program to your offices this month. In it you will find a comprehensive scientific program comprised of newly formatted lectures, special keynote presentations, a new Young Dentist Program and a variety of activities and social events that will make your visit to Montréal thoroughly enjoyable.

In order to do this, we have put together an experienced Convention Organizing Committee. The Organizing Committee is the driving force of new ideas and their implementation into the Convention to make it great. This year several well-known individuals within the Montréal dental community are a part of the Convention Committee. It is my pleasure to introduce them to you at this time and give you some background information on them.

Dr. Micheline Blain graduated from the Université de Montréal and is currently in private practice. Dr. Blain is Assistant to the President of the Québec Dental Surgeons' Association. Dr. Blain is the Past President of Société Dentaire de Montréal and sits on the Board of several sssociations. She is presently on the Board of Administration of the Fonds des professionnels du Québec and was on the CDA Board of Governors from 1986 to 1992.

Dr. Sylvain Gagnon is a 1984 graduate of Université de Montréal and has a private practice in orthodontics in Montréal. Dr. Gagnon is currently President of the Société dentaire de Montréal and is a lecturer in Orthodontics at the Université de Montréal.

Dr. Sylvain Laforte has been in private practice in Montréal since 1986. He was a clinician at the Université de Montréal for nine years. He is the former President of the Société dentaire de Montréal and Past President of the Fédération des sociétés dentaires du Grand Montréal.

Dr. Sam Sgro is a graduate from the Faculty of Dentistry of McGill University from which he also received a Master's degree in Physiology. After graduation, he completed a residency program at the Royal Victoria Hospital before opening a private practice. Dr. Sgro has served on many Committees of the Canadian Dental Association and the Ordre des dentistes du Québec. He is currently President of the Montréal Dental Club and a clinical instructor at McGill University.

Dr. Joseph Szwimer is a graduate from the Faculty of Dentistry, McGill University. In addition to running a dental group practice in Montréal, Dr. Szwimer is a Faculty Lecturer in the Department of Operative and Restorative Dentistry at McGill University. He has been also involved in various dental groups and is presently the President of the Federation of Dental Societies of Greater Montréal and the President of the Alpha Omega Mount Royal Dental Society.

We know that you are beginning to plan your attendance at the 1996 Montréal Convention. Pre-registration will make you eligible for various Convention prizes and enable each Canadian dentist to bring two non-dentist staff members for free, so register early! Your preliminary program is complete with registration and hotel reservation forms. Should you need more information, the Convention office will be happy to assist you.

See you in Montréal this summer!

Michel Jahjah, D.D.S.
Chair
CDA 1996 Convention
1815 Alta Vista Drive
Ottawa, ON K1G 3Y6

Tel: 1-800-267-6354
Fax: (613) 523-3062

SCIENTIFIC PROGRAM

SCALE THE HEIGHTS

Invited Speakers

Herbert I. Bader
D.D.S.
Boston, MA

Marion Balla
M.Ed., M.S.W., C.S.W.
Ottawa, ON

William Blatchford
D.D.S.
Sunriver, OR

Pierre Boudrias
D.M.D., M.S.D.
Montréal, QC

Gisèle Bourgeois
B.A.
Montréal, QC

Patrick Canonne
D.D.S.
Montréal, QC

Michel Couture
D.M.D.
Montréal, QC

Charles Cox
D.M.D.
Birmingham, AL

Alan J. Drinnan
D.D.S., M.D.
Buffalo, NY

Ron Ettinger
D.D.S.
Iowa City, IA

Gilles Gauthier
D.D.S.
Montréal, QC

Gary Glassman
D.D.S.
Toronto, ON

Daniel Haas
D.D.S., Ph.D.
Toronto, ON

Derek Hill
CA
Toronto, ON

David S. Hornbrook
D.D.S.
La Mesa, CA

Jane Jones
R.D.H.
Lake Worth, FL

Jon T. Kapala
D.M.D., M.Sc. D.
Boston, MA

Mary Ann Kindy
Toronto, ON

Jacinthe Larivée
D.D.S.
Montréal, QC

Alan Lowe
D.M.D., Dip. Ortho., Ph.D.
Vancouver, BC

Pierre MacKay
D.D.S.
Montréal, QC

Joseph Massad
D.D.S.
Tulas, OK

Don McCallum
Ottawa, ON

John N. Nasedkin
D.D.S., M.R.C.D.,
F.A.D.M.
Vancouver, BC

Thomas H. Olson
J.D., LL.M. (Taxation)
Calgary, AB

Harold T. Perry
D.D.S., M.S.D., Ph.D.
Elgin, IL

Rénald Pérusse
D.M.D., M.D.
Québec, QC

Trey L. Petty
D.D.S., F.A.G.D.
Calgary, AB

Huan Pham
D.D.S.
Montréal, QC

Robert Seguin
D.D.S.
Buckingham, QC

Kenneth Serota
D.D.S., M.M.Sc.
Toronto, ON

Cary A. Shapoff
D.D.S.
Fairfield, CT

Mike M. Suzuki
D.D.S., M.S., D.M.D.
Winnipeg, MB

Wava M. Truscott
Ph.D.
Rockville Centre, NY

Samuel L. Yankell
Ph.D., R.D.H.
Philadelphia, PA

Keynote Speakers

Michael F. Jacobson
Ph.D.
Washington, DC

Louise Lambert-Lagacé
B.Sc. Nutrition
Montréal, QC

Robert Pritikin
Director, Pritikin
Longevity Centre
Santa Monica, CA

Joseph Schwarcz
Ph.D.
Montréal, QC

& PEAK YOUR SKILLS

Preliminary Lecture Titles & Courses Offered

- Aesthetic Posterior Restorations
- Aesthetic Resin Bonded Restorations and Clinical Limitations
- Aesthetics and Function — Integrating Aesthetics and Occlusion/tm Joint with Ceramic and Adhesive Concepts
- Common Oral Lesions of Interest to the Dental Team
- Contrôle de l'infection
- Dentistry/TMD: Past, Present and Future
- Diagnosis and Treatment Planning of Difficult Denture Patients — How to Make Dentures Fun
- Différentes sortes de couronnes en endodontie
- Effective Communication with Staff and Clients in the Dental Environment
- Emergencies in the Dental Office
- Endodontie
- Financial Planning for Dental Assistants and Hygienists: Creating Financial Wealth
- Glove Usage: Can One of Your Best Sources of Protection be a Potential Risk?
- Guiding the Developing Dentition
- Implants
- Including the Neutral Zone with Today's Technology in our Delivery of Full Dentures
- Infection Control into the Next Century
- Infection Control: What You Don't Know Will Hurt You!
- Les abrasifs
- Lésions pré-malignes et malignes de la cavité buccale
- L'expansion palative : Quand, comment, et pourquoi?
- Managing Traumatic Injuries in the Primary and Immature Permanent Dentitions
- Mastering Aesthetics and Adhesion — Dental Care for the 21st Century
- New Perspectives in Soft Tissue Management
- Nutrition and the Politics of Food
- Oral Appliances for the Treatment of Snoring and/or Obstructive Sleep Apnea
- Overview of New Toothbrush Research
- Pain Control and Patient Management: Analgesics
- Pain Control and Patient Management: Local Anaesthetics and Vasoconstrictors
- Periodontal Surgical Procedures — What They are All About and When to Do Them
- Periodontal Treatment in a General Practice — What to Do and What Not to Do
- Planification fiscale pour le personnel dentaire
- Positive Skills for Effective Leadership Within Dental Practices
- Préparation de couronnes complètes et prises d'emprintes
- Presenting Ideal Treatment and Getting a "Yes"
- Prothèses partielles amovibles prévention suite aux traitements de couronnes et ponts et implants
- Pulp Fiction: Myths and Misconceptions
- Running a Successful Practice: Let's Make it Fun and Profitable!
- Scaling and Root Planing
- Selecting the Appropriate Anterior Crown and Tooth-Coloured Inlay/Onlay
- Tax Loopholes
- The Balancing Act — Managing Stress Creatively
- The Patient-Driven Practice
- Things That Make a Difference in the Success of Your Practice
- Using Tax Savings to Secure Your Retirement

Consult your 1996 CDA Convention preliminary program which is being mailed to your office this month for a more complete listing of speakers and their lecture titles.

NEW — THIS YEAR AT THE CANADIAN DENTAL ASSOCIATION CONVENTION

YOUNG DENTIST PROGRAM

Monday, August 19, 1996

Sponsored by the Canadian Dental Association and the Canadian Dental Service Plans Inc. (CDSPI)

The Canadian Dental Association will offer a **special program for young dentists** during its annual Convention. The CDA recognizes the specific needs of the new members of the dental profession. As such, if you have graduated between 1986 and 1996, you are invited to a full day of activities specifically designed to provide you with up-to-date information that will prove extremely valuable at the start of your career.

Plan to attend! Your registration to the Convention gives you access to the Young Dentist Program.

For further information, contact the CDA Convention Department at 1-800-267-6354.

Social Program

OPENING Ceremony

Sunday, August 18

This year, CDA Convention participants are in for a real treat as the highly acclaimed **Rosita Perez** takes the floor at the Opening Ceremony. Ms. Perez's charm and honesty has profoundly touched the lives of audiences throughout North America. Equipped with humour, straight forwardness and a guitar, she captivates her audiences through anecdotal speech and song guiding their emotions from laughter to tears. Her title performance "Sing Your Songs and Leave the High Notes for Pavarotti!" on Sunday evening will be well remembered by participants as Ms. Perez always delivers standing ovation performances.

Circus acts will open the evening prior to Ms. Perez's performance and will be great entertainment for all!

The Opening Ceremony is open to all registered Convention participants. To register for this event, select "Yes" for Opening Ceremony on your enrolment form. Tickets are limited and enrolment is processed on a first-come, first-served basis.

Tickets for the other social events may be obtained by selecting the appropriate box on your registration form. ***Register early to avoid disappointment!***

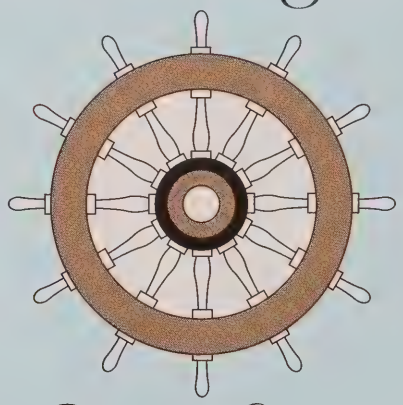
Sunday, August 18

MEET & Greet

Following the Opening Ceremony, participants may register for the ***Meet & Greet***, an informal gathering where dental professionals mingle with their family and colleagues from across Canada. A light meal will be served and the entertainment will create a lively and relaxing atmosphere.

Monday, August 19

President's Gala



Dinner Cruise

Those wishing to participate in the President's Gala this year will enjoy an evening on the water. Convention participants will feast on a sit-down meal aboard a comfortable cruise ship, then dance the evening away under the stars!

Visits & One-Day Tours

Saturday, August 17

DELUXE CITY TOUR

Enjoy a commentated tour of many city sites, including Notre-Dame Basilica, Mount Royal Lookout, Chinatown, St. Joseph's Oratory and Beaver Lake. Then visit The Olympic Tower, the Botanical Gardens and the Biodôme.

Sunday, August 18

DISCOVER OLD MONTRÉAL

A delightful walking tour of Old Montréal, lunch at one of the restaurants in Old Montréal and visit to Point-à-Callière, Montréal's Museum of Archaeology and History.

Monday, August 19

A DAY IN CHARMING KNOWLTON

Your visit to a charming 1802 village includes a guided walking tour, lunch at a quaint old inn and shopping in boutiques, craft shops and factory outlet stores.

Tuesday, August 20

A SHOPPING EXTRAVAGANZA

A day of shopping "behind closed doors" at several manufacturer and designer showrooms in Montréal. Take advantage of savings up to 50% on various designer wardrobe collections as well as up to 40% on exclusive jewellery.

For more details, consult your CDA 1996 preliminary program which will be mailed to your office this month or contact CDA Conventions at 1-800-267-6354.

CHILDREN'S PROGRAM

SUNDAY, AUGUST 18

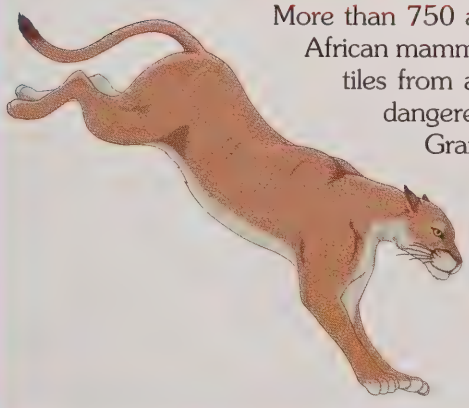
Mount Royal, Imax & Expotec

A half day of exploration and adventure at Mount Royal Park then off to Montréal's Imax Theatre and Expotec for entertainment and recreation.

MONDAY, AUGUST 19

Granby Zoo

More than 750 animals, with a great selection of African mammals, big cats, exotic birds and reptiles from all continents including many endangered species make their home at the Granby Zoo.



TUESDAY, AUGUST 20

La Ronde & Magic Show

A day of thrills and excitement combined with a magnificent show of magic, wonder and intrigue.

1996 FDI CONGRESS & CDA OUT-OF-COUNTRY SEMINARS

FDI 1996 World Dental Congress • September 28 - October 1

The 84th World Dental Congress will be hosted by the American Dental Association in the fall of 1996.

The ADA and FDI have planned many exciting events and social programs to complement the comprehensive scientific program and bustling exhibit hall prepared for registered participants. The FDI Congress occurs but once a year and it is a great opportunity for dental professionals worldwide to meet together.

To help make your arrangements to the FDI convenient and worry-free, the CDA in cooperation with Tourcan Vacations has organized air and hotel accommodation packages for CDA member dentists.

These packages include round trip air travel and hotel accommodation at Orlando's deluxe Castle Hotel (Holiday Inn Select).

But that's not all!

CDA has also put together pre and post FDI Congress tours to a few Southern destinations.

A wonderful 4-day cruise in the Gulf of Mexico will help you enjoy a few days of relaxation prior to the FDI meeting. Or perhaps you'd like to spend a few days at Walt Disney World with the family just following the Congress. Then again maybe you'd like to travel to the Galapagos Islands or Costa Rica before returning to the office. ***Whatever your pleasure, the tours are sure to be a delight.***

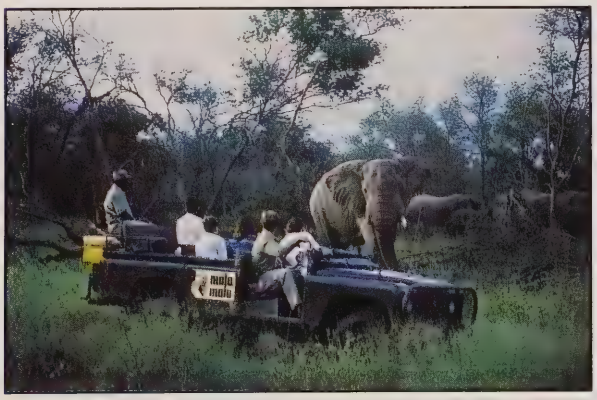
Here is a list of these tours and their dates:

Gulf of Mexico Cruise	September 23 - 27
Walt Disney World	October 2 - 6
Galapagos Islands	October 2 - 10
Costa Rica	October 2 - 11

CDA 1996 Out-of-Country Seminars

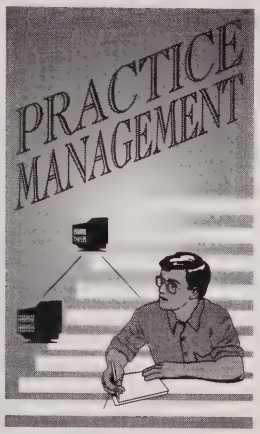
In addition to the international dental congress, CDA member dentists can take advantage of other out-of-country dental seminars. Several destinations have been chosen for the 1996 year. Those still available to you are:

SOUTH AFRICA (May 3 - 16, 1996)
A wonderful tour to one of the most diverse and interesting countries in the world. This tour will take you on amazing safari game drives, enrich you with the simple culture of its native peoples and delight your eyes with the beauty and majesty of untouched wildlife.



MOROCCO (June 29 - July 14, 1996)
A trip to Morocco is an adventure like none other. Your tour will consist of visits to Royal Palaces, Roman ruins, mausoleums, medinas and bustling marketplaces with colourful handicrafts and bargains to bring home!

To receive more information on the FDI 1996 Congress or the remaining CDA 1996 Out-of-Country Seminars, contact CDA Conventions at 1-800-267-6354.



The Internet: Your Bridge to World Dentistry

Edward J. Barrett, B.Sc., DDS, M.Sc.
David J. Kenny, B.Sc., DDS, PhD

Introduction

Computerized practice management systems and electronic data interchange (EDI) have become commonplace in dental offices, yet their potential is barely tapped. In a recent survey by the Canadian Dental Association Library, 71 per cent of Canadian dentists reported having an in-office computer and 55 per cent an in-office modem.[1] Similarly, 72 per cent of dentists reported having a home computer and 15 per cent had conducted Internet searches. *The Globe and Mail* recently published survey results indicating that more than one million Canadians are now connected to the Internet.[2] Seventy-four per cent of these Canadian Internet browsers are male, half are under 35 years of age, and half have a university degree. Many dentists are already connected to the Internet, while others have almost all the computer gear they need to "surf the Net." Computer networking and the Internet clearly hold much promise for the exchange of dental information. This paper will explore the potential of the Internet, and discuss how you can "get on-line."

What Is the Internet?

The Internet is a global computer network that links approximately 60,000 individual computer networks. It continues to grow by about 10 per cent per month.[2] Globally, 4.0 million people currently access the Internet.[2] Because the Internet is unmoderated and has no central office, information obtained through the network may be out-of-date, misleading or simply not factual. Thus, while many scientific journals are making their contents available on-line, the editors of the *New England Journal of Medicine* have, for the time being at least, decided not to do so.[4]

The Internet acts as a repository for multimedia information. This information, in the form of text, graphics, video, audio, or computer software, can be on virtually any subject. In addition, the Internet's electronic mail (or e-mail) feature allows individuals to communicate quickly and easily, without little or no regard to international borders or time zones.

Many different software programs are available to retrieve information from the Internet. Generally, each of these programs is capable of a specific task, such as retrieving a program, or composing and sending e-mail. However, with the growing popularity of the World Wide Web, only one program is necessary to "surf the Net."

The World Wide Web

The World Wide Web (WWW) is by far the fastest growing part of the Internet, and is widely considered to be its future.[2,4] The WWW consists of home pages or Websites set up by individuals, groups or institutions. A Website may contain graphics, text, audio and video related to a specific topic. Each Website is identified by a unique address called a uniform resource locator (URL).

The elegance of WWW lies in its simplicity. By using a program such as Netscape, and simply "pointing and clicking" on underlined text, icons or highlighted pictures, the user is able to "travel" to other linked information. The power and simplicity of the WWW interface illustrates the Internet's potential as a medium for the exchange of information between individual dentists, universities, hospitals and dental organizations.

Dentistry On the Internet

Although the Internet is a sprawling environment, finding specific information is becoming easier thanks to programs called search engines. The most popular of these programs is called Yahoo!, and works much like a WWW home page (URL is http://www.yahoo.com/). **Fig. 1** shows the results of a search for information sites using "dentistry" as a key word. By clicking on any of the underlined text, the dentist can link to specific information. Another extensive listing of dental-related information is maintained by New York University's college of dentistry (URL is http://www.nyu.edu/Dental).

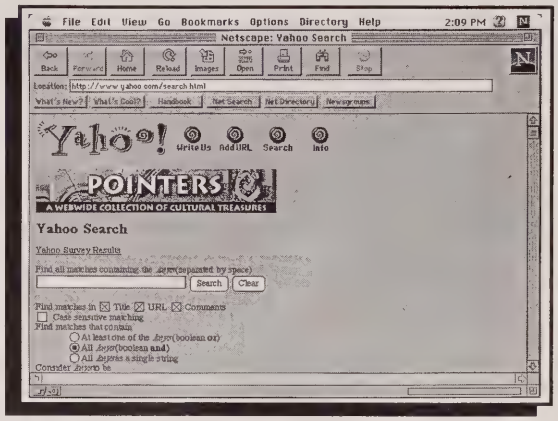


Fig. 1: *Yahoo! home page.*

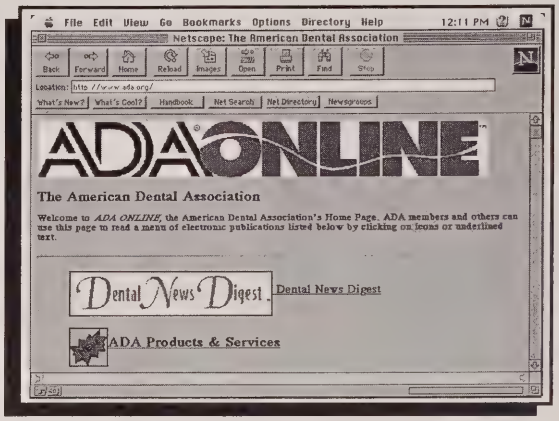


Fig. 2: *ADA Online home page.*

Websites and other on-line services provide an excellent platform for professional organizations to rapidly inform members of issues that may affect them in their practice. The American Dental Association, for example, maintains a website called ADA Online (URL is http://www.ada.org/) (**Fig. 2**). From this site, dentists can obtain information about ADA activities at state and national levels. At present, CDA does not provide a similar service. The association expects to have established a home page on the Internet within the next three to four months, however, which will allow users to access information about Canadian dentistry, recent CDA Library acquisitions and packages, CDA policy statements and guidelines, and all the services that the association offers to its members.[1]

Most of the dental-related Websites currently on-line are operated by university faculties of dentistry. There is a great deal of variation in the quantity and quality of dental information available on the Internet. Some sites provide only text-based information about academic programs, while others provide multimedia information about a single topic. For example, the DENTalTRAUMA site operated by the departments of orthodontics and pedodontics at the University of Geneva (URL is http://www.unige.ch/smd/orthotr.html) contains information on traumatic injuries to the dentition. Unfortunately, the vast majority of Websites for dentistry contain limited information and are not regularly maintained. Many of these sites were placed on the WWW before they were "completed," and are referred to as being "under construction." At the time of writing, the DENTalTRAUMA site was still "under construction," but had not been updated since October 1994. Enthusiasm for establishing dental sites on the WWW has exceeded the desire to maintain them and carefully plan their format and content. The result is an extensive list of dental Websites with not-so impressive content.

Does the lack of quality dental information on the WWW mean that the network should be ignored? The answer is an emphatic no. While many dental Websites are in their infancy, the future of dental information on the Internet is promising. In order to fully realize its potential, institutions and individuals who put dental home pages on the WWW must first decide what information to make available and then make a commitment to the regular maintenance of their site so that information is accurate and up-to-date.

Proposed Hospital For Sick Children Dental Website

Because it has recognized both the commitment required to establish and maintain a Website, and the problem of languishing or abandoned dental Websites, The Hospital For Sick Children in Toronto (HSC) has planned its proposed Website carefully. Once online, this site will provide the following information:

1. Clinical data, such as pediatric drug dosages, and up-to-date management information for dental trauma;
2. Educational information, such as case reports, that will be changed regularly;
3. Current departmental research;
4. Upcoming continuing education courses; and
5. A forum where questions about pediatric dentistry can be reviewed.

One person will be responsible for updating the Website and organizing the e-mail questions received at the site through the Internet. The HSC Website will be linked to the department of pediatric dentistry at Dalhousie University, allowing the two institutions to share both resources and information. Additional links may be established with dental publications and dental organizations. The HSC Website is expected to be on-line in 1996. If you would like to be kept informed on when the site will be operational, send your e-mail address to HSCDent@sickkids.on.ca.

Accessing the Internet

To access resources on the Internet, you have to be connected to a computer network. If you are not affiliated with an institution (university or hospital), you will likely access the Internet from your home or office. Once you have a computer (IBM compatible PC or Macintosh) and a modem, you need to find an Internet service

provider. These companies provide telephone access to the Internet for a monthly fee. An alternative to buying Internet access from a service provider is to get on a local freenet.[6] Unlike the profit-motivated commercial access providers, freenets provide users with "free" access to electronic mail and the Internet.[3] The major problem with freenets is access. It is usually more difficult to access the Internet through a freenet, because freenets operate fewer telephone lines. In addition, they often lack graphics capability, which prevents users from viewing the graphics and/or movie clips available on the Internet. For an exhaustive listing of Internet service providers in Canada, consult *The Canadian Internet Handbook* by Carrol and Broadhead.[7]

How you connect to the Internet will influence how quickly information can be retrieved. This is an important consideration, because downloading large graphics, text, or video files can be time-consuming. For example, the Ethernet network used by many institutions is one of the fastest connections available. From home or office, speed of access is limited by the medium over which the information is transmitted — namely, the analog copper wire lines provided by the local telephone network.[6] People who are familiar with both of these network connections can attest to the superiority of Ethernet over telephone lines. In the future, however, cable companies may provide Internet access over coaxial cables that are capable of carrying more information than single copper wires.[6] Fibre-optic cable represents the fastest means of transmitting data, but at present its widespread use is cost-prohibitive.[6]

Conclusion

The Internet holds great potential for the dental profession, particularly in allowing the rapid recovery of current clinical information by busy dentists. Changes in treatment techniques and drug dosages can be posted daily, without the two to 10 month publication delay common in scientific journals. A dentist can access this information, print it, and use it in less than 10 minutes. Furthermore, dentists from around the world can access information and communicate with each other through e-mail. As such, the Internet offers the first opportunity to break the "cottage industry" isolation that is the nature of private dental practice.

Sites for dental information on the Internet are still in their infancy, but much medical and scientific information, as well as library services, are already available. Your children or young patients are probably familiar with the Internet already. With the right equipment and a little expert advice, in a couple of months you could be a "surfer" as well. ■

Acknowledgments: Thanks to ADA Online and Aaron Bromagem at Yahoo! for permission to print **Figs. 1** and **2**.

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HSC Website information: HSCDent@sickkids.on.ca.

Reprint requests to: Dr. E.J. Barrett, Faculty of Dentistry, Dalhousie University, 5981 University Avenue, Halifax, NS B3H 3J5.

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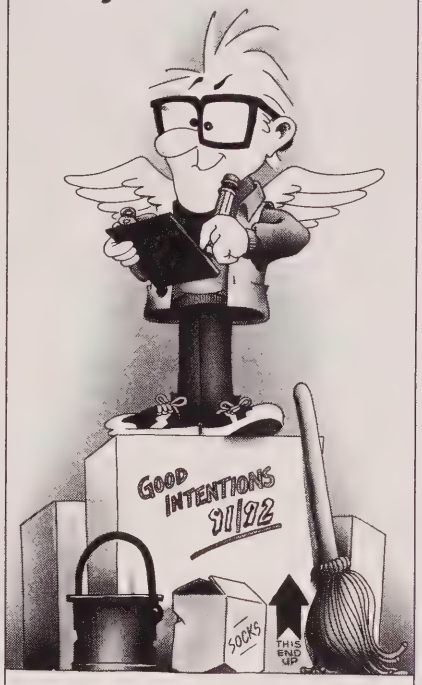
7. Carrol, J. and Broadhead, R. *Canadian Internet Handbook.* Prentice Hall Canada Inc.: Scarborough, 1995.

I'm doing some housecleaning in the back of your mind...



Hi! It's me, your conscience. Between old phone numbers, song lyrics, and lame excuses, there's a lot of clean up to do!

But there are also great things back here. Look! A desire to help out a friend, a wish to give time to a worthy cause, the intention to help your community and your neighbours – and more!

Let's move this stuff up to the *front* of your mind and use it to change the world. Helping causes we care about will be a breeze without all the clutter, so let's get to it!

Oh, and by the way, that little widget you can't find is in the back of your top dresser drawer...

IMAGINE

Imagine is a national program to encourage giving and volunteering.

TORADOL®

10 mg tablets & 30 mg/mL IM injections KETOROLAC TROMETHAMINE

Effectively treating acute pain

TORADOL® (ketorolac tromethamine) 10 mg tablets
TORADOL® IM (ketorolac tromethamine injection) 10 mg/mL or 30 mg/mL intramuscular injection
THERAPEUTIC CLASSIFICATION NSAID Analgesic Agent

ACTION

Toradol (ketorolac tromethamine) is a non-steroidal anti-inflammatory drug (NSAID) that exhibits analgesic activity mediated by peripheral effects. Ketorolac inhibits the synthesis of prostaglandins through inhibition of the cyclo-oxygenase enzyme system. At analgesic doses, it has minimal anti-inflammatory and antipyretic activity. Pain relief is comparable following the administration of ketorolac by intramuscular or oral routes. The peak analgesic effect occurs at 2-3 hours post-dosing with no evidence of a statistically significant difference over the recommended dosage range. The greatest difference between large and small doses of Toradol administered by either route is in the duration of analgesia. Ketorolac tromethamine is rapidly and completely absorbed when administered by either the oral or the intramuscular route. The pharmacokinetics are linear following single and multiple dosing. Steady state plasma levels are attained after one day of Q.I.D. dosing. Following oral administration, peak plasma concentrations of 0.7 to 1.1 µg/mL occur at an average of 44 minutes after a single 10 mg dose. The terminal plasma elimination half-life ranges between 2.4 and 9.0 hours in healthy adults, and between 4.3 and 7.6 hours in elderly subjects (mean age 72 yrs). A high fat meal decreases the rate, but not the extent, of absorption of oral ketorolac tromethamine. The use of an antacid has not been demonstrated to affect the pharmacokinetics of ketorolac. Following intramuscular administration, peak plasma concentrations of 2.2 to 3.0 µg/mL occur an average of 50 minutes after a single 30 mg dose. The terminal plasma half-life ranges between 3.5 and 9.2 hours in young adults and between 4.7 and 8.6 hours in elderly subjects (mean age = 72 years). In renally impaired patients there is a reduction in clearance and an increase in the terminal half-life of ketorolac tromethamine (see table below). The primary route of excretion of ketorolac tromethamine and its metabolites (conjugates and the p-hydroxy metabolite) is in the urine (91.4%) with the remainder (6.1%) being excreted in the feces. More than 99% of the ketorolac in plasma is protein bound over a wide concentration range. The parenteral administration of Toradol has not been demonstrated to affect the hemodynamics of anaesthetized patients.

THE INFLUENCE OF AGE, LIVER AND KIDNEY FUNCTION ON THE CLEARANCE AND TERMINAL HALF-LIFE OF TORADOL IM[1] AND ORAL[2]

TYPES OF SUBJECTS	TOTAL CLEARANCE (in L/h/kg)[3]		TERMINAL HALF-LIFE (in hours)	
	IM MEAN (range)	ORAL MEAN (range)	IM MEAN (range)	ORAL MEAN (range)
Normal Subjects IM (n=54) Oral (n=77)	0.023 (0.010-0.046)	0.025 (0.013-0.050)	5.3 (3.5-9.2)	5.3 (2.4-9.0)
Healthy Elderly Subjects IM (n=13), Oral (n=12) (mean age = 72, range = 65-78)	0.019 (0.013-0.034)	0.024 (0.018-0.034)	7.0 (4.7-8.6)	6.1 (4.3-7.6)
Patients with Hepatic Dysfunction IM and Oral (n=7)	0.029 (0.013-0.066)	0.033 (0.019-0.051)	5.4 (2.2-6.9)	4.5 (1.6-7.6)
Patients with Renal Impairment IM and Oral (n=9)(serum creatinine 1.9 - 5.0 mg/dL)	0.014 (0.007-0.043)	0.016 (0.007-0.052)	10.3 (8.1-15.7)	10.8 (3.4-18.9)
Renal Dialysis Patients IM (n=9)	0.016 (0.003-0.036)		13.6 (8.0-39.1)	

[1] Estimated from 30 mg single IM doses of ketorolac tromethamine
[2] Estimated from 10 mg single oral doses of ketorolac tromethamine
[3] Litres/hour/kilogram

INDICATIONS

Oral Route: Orally administered Toradol (ketorolac tromethamine) is indicated for the short-term management (not to exceed 5 days for post-surgical patients or 7 days for patients with musculoskeletal pain) of moderate to moderately severe acute pain, including post-surgical pain (such as general, orthopaedic and dental surgery), acute musculoskeletal trauma pain and post-partum uterine cramping pain. (See WARNINGS and DOSAGE AND ADMINISTRATION)

Intramuscular Route: Intramuscular injection of Toradol is indicated for the short-term management (not to exceed 2 days) of moderate to severe acute pain, including pain following major abdominal, orthopaedic and gynecological operative procedures. The total duration of combined intramuscular and oral treatment should not exceed 5 days.

CONTRAINDICATIONS

Hypersensitivity: Like other non-steroidal anti-inflammatory drugs, Toradol (ketorolac tromethamine) has been associated with hypersensitivity reactions. Toradol should not be used when there is a known or suspected hypersensitivity to the drug and should be discontinued in patients who develop symptoms of hypersensitivity during therapy. Because of the possibility of cross-sensitivity, Toradol should not be used in patients with the complete or partial syndrome of nasal polyps, angioedema, bronchospastic reactivity (e.g. asthma) or other allergic manifestations to acetylsalicylic acid (ASA) or other non-steroidal anti-inflammatory drugs. Severe and fatal anaphylactoid reactions have occurred in such individuals.

Gastrointestinal: Toradol should not be used in patients with suspected or confirmed peptic ulcer disease, gastrointestinal bleeding or perforation, or active inflammatory disease of the gastrointestinal system or in patients who have a history of these disorders. Severe and fatal reactions have occurred in such individuals.

Renal Impairment: Toradol is contraindicated in patients with moderate to severe renal impairment or in patients at risk for renal failure due to volume depletion.

Haemorrhagic Risk: Toradol is contraindicated immediately before any major surgery, and is contraindicated intraoperatively when hemostasis is critical because of the increased risk of bleeding. Toradol is also contraindicated in patients with coagulation disorders, postoperative patients with high haemorrhagic risk or incomplete haemostasis, and in patients with suspected or confirmed cerebrovascular bleeding.

Obstetrics: Toradol is contraindicated in labour and delivery because, through its prostaglandin synthesis inhibitory effect, it may adversely affect fetal circulation and inhibit uterine musculature, thus increasing the risk of uterine hemorrhage.

Neuraxial Administration: Toradol IM is contraindicated for neuraxial (epidural or intrathecal) administration due to its alcohol content.

Concomitant Medications: Toradol is contraindicated in patients currently receiving ASA or NSAIDs because of the cumulative risks of inducing serious NSAID-related adverse events. The concomitant use of Toradol and probenecid is also contraindicated.

WARNINGS

The long-term administration of Toradol (ketorolac tromethamine) is not recommended as the incidence of side-effects increases with the duration of treatment (see INDICATIONS and DOSAGE AND ADMINISTRATION). The most serious risks associated with NSAIDs including Toradol are:

Gastrointestinal Ulcerations, Bleeding and Perforation: Serious gastrointestinal toxicity, such as bleeding, ulceration, and perforation, can occur at any time, with or without warning symptoms, during therapy with non-steroidal anti-inflammatory drugs. The incidence of gastrointestinal complications increases with dosage and duration of treatment. Elderly and debilitated patients are more susceptible to these complications. To date, studies with NSAIDs have not identified any subset of patients not at risk for developing peptic ulceration and bleeding. Post-marketing experience with Toradol suggests that there may be a greater risk of gastrointestinal ulcerations, bleeding, and perforation in the elderly, and most spontaneous reports of fatal gastrointestinal events are in the aged population.

THE LONG-TERM USE OF TORADOL IS NOT RECOMMENDED.

Renal Toxicity: The following renal abnormalities have been associated with Toradol and other drugs that inhibit renal prostaglandin biosynthesis: acute renal failure, nephrotic syndrome, interstitial nephritis, renal papillary necrosis. Elevations of blood urea nitrogen (BUN) and creatinine have been reported in clinical trials with ketorolac tromethamine. Toradol is contraindicated in patients with moderate to severe renal impairment. Hypovolemia should be corrected before treatment with Toradol is initiated. Patients who are volume depleted may be dependent on renal prostaglandin production to maintain renal perfusion and, therefore, glomerular filtration rate. In such patients, the use of drugs which inhibit prostaglandin synthesis has been associated with further decreases in renal blood flow and may precipitate acute renal failure. Predisposing factors include dehydration (e.g. as a result of extreme exercise, vomiting or diarrhea associated with the loss of at least 5 to 10% of total body weight, unreplenished blood loss of approximately 500 mL), sepsis, impaired renal function, heart failure, liver dysfunction, diuretic therapy, and advanced age. Caution is advised if ketorolac tromethamine is used in such circumstances. Close monitoring of urine output, serum urea and serum creatinine is recommended until renal function recovers.

Fluid Retention and Edema: Fluid retention, edema, NaCl retention, oliguria, elevations of serum urea nitrogen and creatinine have been observed in patients treated with Toradol. Therefore, the possibility of precipitating congestive heart failure in elderly patients or those with compromised cardiac function should be considered. Toradol should be used with caution in patients with cardiac decompensation, hypertension or other conditions which cause a predisposition to fluid retention.

Haemorrhage: Postoperative haematomas and other symptoms of wound bleeding have been reported in association with the perioperative use of intramuscular Toradol. Toradol is contraindicated in patients who have coagulation disorders. If Toradol is to be administered to patients who are receiving drug therapy that interferes with haemostasis, careful observation is advised. Use of Toradol in patients who are receiving therapy that affects hemostasis should be undertaken with caution, including close monitoring. The concurrent use of Toradol and prophylactic, low dose heparin (2500-5000 units q12h), warfarin and dextrans may also be associated with an increased risk of bleeding (see DRUG INTERACTIONS). In patients receiving anticoagulants, the risk of intramuscular haematoma formation from Toradol IM injections is increased.

Hypersensitivity Reactions: The possibility of severe or fatal hypersensitivity reactions should be considered, even for patients with no known history of previous exposure or hypersensitivity to Toradol or other NSAIDs. Counteractive measures must be available when administering the first dose of Toradol IM. As with other NSAIDs, patients should be questioned for history of allergy to NSAIDs or ASA or for the syndrome consisting of nasal polyps, ASA allergy and asthma before being prescribed Toradol. Asthmatic patients with triad asthma (the syndrome of nasal polyps, asthma and hypersensitivity to ASA or other NSAIDs) may be at particular risk for severe hypersensitivity reactions.

Use in Pregnancy and Lactation: The administration of ketorolac tromethamine is not recommended during pregnancy or lactation. After 1 day at 10 mg q.i.d. oral dosing, Toradol has been detected in the milk of lactating women at a maximum concentration of 7.9 ng/mL.

Use in Children: Safety and efficacy in children have not been established. Therefore, Toradol is not recommended for use in children under age 16.

Use in the Elderly: Because ketorolac is cleared somewhat more slowly by the elderly (See PHARMACOKINETICS) who are also more sensitive to the gastrointestinal and renal effects of NSAIDs, (See WARNINGS and PRECAUTIONS) extra caution and the lowest effective dose (See DOSAGE AND ADMINISTRATION) should be used.

PRECAUTIONS

Physicians should be alert to the pharmacologic similarity of Toradol (ketorolac tromethamine) to other non-steroidal anti-inflammatory drugs that inhibit cyclo-oxygenase.

Gastrointestinal Effects: Close medical supervision is recommended in patients prone to gastro-intestinal tract irritation. In these cases, the physician must weigh the benefits of treatment against the possible hazards. Patients taking any NSAID including ketorolac tromethamine should be instructed to contact a physician immediately if they experience symptoms or signs suggestive of peptic ulceration or gastrointestinal bleeding. These reactions can occur at any time during the treatment. If peptic ulceration is suspected or confirmed, or if gastrointestinal bleeding occurs, ketorolac tromethamine should be discontinued and appropriate treatment instituted with close patient monitoring.

Hepatic Effects: Caution should be observed if Toradol is to be used in patients with impaired hepatic function, or a history of liver disease. Treatment with Toradol may cause elevations of liver enzymes, and in patients with pre-existing liver dysfunction, it may lead to the development of a more severe hepatic reaction. Meaningful elevations (greater than 3 times normal) of serum transaminases (glutamate pyruvate [SGPT or ALT] and glutamic oxaloacetic [SGOT or AST], occurred in controlled clinical trials in less than 1% of patients. If clinical signs and symptoms consistent with liver disease develop, or if systemic manifestations occur (e.g., eosinophilia, rash, etc.), ketorolac tromethamine should be discontinued. Patients with impaired hepatic function from cirrhosis do not have any clinically important changes in ketorolac tromethamine clearance. Studies in patients with active hepatitis or cholestasis have not been performed.

Hematologic Effects: Ketorolac tromethamine inhibits platelet function and may prolong bleeding time. It does not affect platelet count, prothrombin time (PT) or partial thromboplastin time (PTT). Unlike the prolonged effects from ASA the inhibition of platelet function by ketorolac tromethamine is normalized within 24 to 48 hours after the drug is discontinued. Blood dyscrasias associated with the use of NSAIDs are rare, but could occur with severe consequences.

Infection: In common with other non-steroidal anti-inflammatory drugs, ketorolac tromethamine may mask the usual signs of infection.

DRUG INTERACTIONS

Protein Binding: Toradol (ketorolac tromethamine) is highly bound to human plasma protein (mean 99.2%) and binding is independent of concentration. As ketorolac tromethamine is a highly potent drug and present in low concentrations in plasma, it would not be expected to displace other protein-bound drugs significantly. Therapeutic concentrations of digoxin, warfarin, acetaminophen, phenytoin, and tolbutamide did not alter ketorolac tromethamine protein binding.

Anticoagulant Therapy: Prothrombin time should be carefully monitored in all patients receiving oral anticoagulant therapy concomitantly with ketorolac tromethamine. Toradol IM given with two doses of 5000 U of heparin to 11 healthy volunteers, resulted in a mean template bleeding time of 6.4 min (3.2-11.4 min) compared to a mean of 6.0 min (3.4-7.5 min) for heparin alone and 5.1 min (3.5-8.5 min) for placebo. The *in vitro* binding of warfarin to plasma proteins is only slightly reduced by ketorolac tromethamine (99.5% control vs. 99.3%) at plasma concentrations of 5 to 10 µg/mL.

Digoxin: Ketorolac tromethamine does not alter digoxin protein binding.

Salicylates: *In vitro* studies indicated that, at therapeutic concentrations of salicylates (300 µg/mL), the binding of ketorolac tromethamine was reduced from approximately 99.2% to 97.5% representing a potential two-fold increase in unbound Toradol plasma levels.

Enzyme Induction: There is no evidence, in animal or human studies, that ketorolac tromethamine induces or inhibits the hepatic enzymes capable of metabolizing itself or other drugs. Hence, it would not be expected to alter the pharmacokinetics of other drugs due to enzyme induction or inhibition mechanisms.

Probenecid: Concomitant administration of ketorolac tromethamine and probenecid results in the decreased clearance of ketorolac and a significant increase in ketorolac plasma levels (approximately three-fold increase) and terminal half-life (approximately two-fold increase). The concomitant use of Toradol and probenecid is, therefore, contraindicated.

Furosemide: Ketorolac tromethamine reduces the diuretic response to furosemide by approximately 20% in normovolemic subjects.

Lithium: Some NSAIDs have been reported to inhibit renal lithium clearance, leading to an increase in plasma lithium concentrations and potential lithium toxicity. The effect of ketorolac tromethamine on lithium plasma levels has not been studied.

Methotrexate: The concomitant administration of methotrexate and some NSAIDs has been reported to reduce the clearance of methotrexate, thus enhancing its toxicity. The effect of ketorolac tromethamine on methotrexate clearance has not been studied.

ACE Inhibitors: Concomitant use of ACE inhibitors and other NSAIDs may increase the risk of renal impairment, particularly in volume depleted patients.

Morphine: Intramuscular Toradol has been administered concurrently with morphine in several clinical trials of postoperative pain without evidence of adverse interactions.

ADVERSE EVENTS

TORADOL TABLETS

Short-Term Patient Studies

The incidence of adverse reactions in 371 patients receiving multiple 10 mg doses of Toradol (ketorolac tromethamine) for pain resulting from surgery or dental extraction during the post operative period (less than 2 weeks) is listed below. These reactions may or may not be drug related.

Incidence Between 4 and 9%: Nervous System: Somnolence, insomnia. **Digestive System:** Nausea. **Incidence Between 2 and 3%: Nervous System:** Nervousness, headache, dizziness. **Digestive System:** Diarrhea, dyspepsia, gastrointestinal pain, constipation. **Body As A Whole:** Fever. **Incidence 1% or Less: Nervous System:** Abnormal dreams, anxiety, dry mouth, hyperkinesia, paresthesia, increased sweating, euphoria, hallucinations. **Digestive System:** Anorexia, flatulence, vomiting, stomatitis, gastritis, gastrointestinal disorder, sore throat. **Body As A Whole:** Asthenia, pain, back pain. **Cardiovascular System:** Vasodilatation, palpitation, migraine, hypertension. **Respiratory System:** Cough increased, rhinitis, dry nose. **Musculo-skeletal System:** Myalgia, arthralgia. **Skin & Appendages:** Rash, urticaria. **Special Senses:** Blurred vision, ear pain. **Urogenital System:** Dysuria.

Long-Term Patient Study

The adverse reactions listed below were reported to be probably related to study drug in 553 patients receiving long-term oral therapy (approximately 1 year) with Toradol.

Incidence Between 10 and 12%: Digestive System: Dyspepsia, gastrointestinal pain. **Incidence Between 4 and 9%: Digestive System:** Nausea, constipation. **Nervous System:** Headache. **Incidence Between 2 and 3%: Digestive System:** Diarrhea, flatulence, gastrointestinal fullness, peptic ulcers. **Nervous System:** Dizziness, somnolence. **Metabolic/Nutritional Disorder:** Edema. **Incidence 1% or Less: Digestive System:** Eructation, stomatitis, vomiting, anorexia, duodenal ulcer, gastritis, gastrointestinal haemorrhage, increased appetite, melena, mouth ulceration, rectal bleeding, sore mouth. **Nervous System:** Abnormal dreams, anxiety, depression, dry mouth, insomnia, nervousness, paresthesia. **Special Senses:** Tinnitus, taste perversion, abnormal vision, blurred vision, deafness, lacrimation disorder. **Metabolic/Nutritional Disorder:** Weight gain, alkaline phosphatase increase, BUN increased, excessive thirst, generalized edema, hyperuricemia. **Skin & Appendages:** Pruritus, rash, burning sensation skin. **Body as a Whole:** Asthenia, pain, back pain, face edema, hernia. **Musculo-skeletal System:** Arthralgia, myalgia, joint disorder. **Cardiovascular System:** Chest pain, chest pain substernal, migraine. **Respiratory System:** Dyspnea, asthma, epistaxis. **Urogenital System:** Hematuria, increased urinary frequency, oliguria, polyuria. **Hemic & Lymphatic** Anemia, purpura.

TORADOL IM

The adverse reactions listed below were reported in Toradol IM clinical efficacy trials. In these trials patients (N=660) received either single 30 mg doses (N=151) or multiple 30 mg doses (N=509) over a time period of 5 days or less for pain resulting from surgery. These reactions may or may not be drug related.

Incidence Between 10 and 13%: Nervous System: Somnolence. **Digestive System:** Nausea. **Incidence Between 4 and 9%: Nervous System:** Headache. **Digestive System:** Vomiting. **Injection Site:** Injection site pain. **Incidence Between 2 and 3%: Nervous System:** Sweating, dizziness. **Cardiovascular System:** Vasodilatation.

Incidence 1% or Less: Nervous system: Insomnia, increased dry mouth, abnormal dreams, anxiety, depression, paraesthesia, nervousness, paranoid reaction, speech disorder, euphoria, libido increased, excessive thirst, inability to concentrate, stimulation. **Digestive system:** Flatulence, anorexia, constipation, diarrhea, dyspepsia, gastrointestinal fullness, gastrointestinal haemorrhage, gastrointestinal pain, melena, sore throat, liver function abnormalities, rectal bleeding, stomatitis. **Cardiovascular system:** Hypertension, chest pain, tachycardia, haemorrhage, palpitation, pulmonary embolus, syncope, ventricular tachycardia, pallor, flushing. **Injection site:** Injection site reaction. **Body as a Whole:** Asthenia, fever, back pain, chills, pain, neck pain. **Special senses:** Taste perversion, tinnitus, blurred vision, diplopia, retinal haemorrhage. **Musculo-skeletal system:** Myalgia, twitching. **Respiratory system:** Asthma, cough increased, dyspnea, epistaxis, hiccup, rhinitis. **Skin and appendages:** pruritus, rash, subcutaneous hematoma, skin disorder. **Urogenital system:** Dysuria, urinary retention, oliguria, increased urinary frequency, vaginitis. **Metabolic/nutritional disorders:** edema, hypokalemia, hypovolemia. **Hemic and lymphatic system:** Anemia, coagulation disorder, purpura.

Postmarketing Experience

The following postmarketing adverse experiences have been reported for patients who have received either formulation of Toradol: **Renal Events:** Acute renal failure, flank pain with or without haematuria and/or azotemia, nephritis, hyponatremia, hyperkalemia, hemolytic uremic syndrome, urinary retention. **Hypersensitivity reactions:** Bronchospasm, laryngeal edema, asthma, hypotension, flushing, rash, anaphylaxis, and anaphylactoid reactions. Such reactions have occurred in patients with no prior history of hypersensitivity. **Gastrointestinal Events:** Gastrointestinal hemorrhage, peptic ulceration, gastrointestinal perforation, pancreatitis, melena. **Hematologic Events:** Postoperative wound haemorrhage, rarely requiring blood transfusion (see PRECAUTIONS), thrombocytopenia, epistaxis, leukopenia. **Central Nervous System:** Convulsions, abnormal dreams, hallucinations, hyperkinesia, hearing loss, aseptic meningitis, extrapyramidal symptoms. **Hepatic Events:** Hepatitis, liver failure, cholestatic jaundice. **Cardiovascular:** Pulmonary edema, hypotension, flushing. **Dermatology:** Lyell's syndrome, Stevens-Johnson syndrome, exfoliative dermatitis, maculopapular rash, urticaria. **Body as Whole:** infection.

OVERDOSAGE

In a gastroscopic study of healthy subjects, daily doses of 360 mg given over an 8-hour interval for each of five consecutive days (3 times the highest recommended dose) caused pain and peptic ulcers which resolved after discontinuation of dosing. Metabolic acidosis has been reported following intentional overdosage. Single oral doses of 200 mg have been administered to patients with no apparent serious side effects. Dialysis does not appreciably clear ketorolac from the blood stream.

DOSAGE AND ADMINISTRATION

Adults: Dosage should be adjusted according to the severity of the pain and the response of the patient. **Oral:** The usual oral dose of Toradol (ketorolac tromethamine) is 10 mg every 4 to 6 hours for pain as required. Doses exceeding 40 mg per day are not recommended. The maximum duration of treatment with the oral formulation is 5 days for post-surgical patients and 7 days for patients with musculoskeletal pain.

Intramuscular: The recommended usual initial dose is 10-30 mg, according to pain severity. Subsequent dosing may be 10 mg to 30 mg every 4-6 hours as needed to control pain. The lowest effective dose should be administered. The administration of Toradol IM should be limited to short-term therapy (not over 2 days). The total daily dose should not exceed 120 mg because the risk of toxicity appears to increase with longer use at recommended doses (see WARNINGS and PRECAUTIONS). The administration of continuous multiple daily doses of Toradol IM has not been extensively studied. There has been limited experience with intramuscular dosing for more than 3 days since the vast majority of patients have transferred to oral medication or no longer required analgesic therapy after this time.

If supplementary analgesia is required, a concomitant low dose of opiate can be used.

Patients Under 50 kg, Over Age 65 Years, or With Less Severe Pain at Baseline:
Oral: The lowest effective dose is recommended.

Parenteral: The lower end of the dosage range is recommended. The initial dose should be 10 mg. The total daily dose of Toradol IM in the elderly should not exceed 60 mg.

Impaired Renal Function:
Toradol is not recommended for patients with moderate to severe renal impairment.

Conversion from Parenteral to Oral Therapy:
Toradol tablets may be used either as monotherapy or as follow-on therapy to parenteral ketorolac. When Toradol tablets are used as a follow-on therapy to parenteral ketorolac, the total combined daily dose of ketorolac (oral + parenteral) should not exceed 120 mg in younger adult patients or 60 mg in elderly patients on the day the change of formulation is made. On subsequent days, oral dosing should not exceed the recommended daily maximum of 40 mg. Toradol IM should be replaced by an oral analgesic as soon as feasible. The total duration of combined intramuscular and oral treatment should not exceed 5 days.

Parenteral drug products should be inspected visually for particulate material and discoloration prior to use.

Toradol (ketorolac tromethamine) is a Schedule F drug.

Stability and Storage Recommendations

Toradol Tablets: Store at room temperature with protection from light.

Toradol IM: Store at room temperature with protection from light.

Availability of Dosage Forms
Toradol (ketorolac tromethamine) is available as 10 mg white round film coated tablets with one side printed in red with TORADOL inside bold T and other side with Syntex. Toradol (ketorolac tromethamine) 10 mg tablets are available in bottles of 100 and 500 tablets.

Toradol IM is available in 1 mL ampoules (trays of 10) containing 10 or 30 mg/mL.

Product Monograph available on request.

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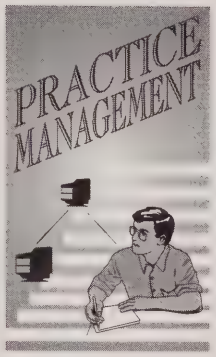

Multimedia Dental Patient Education Systems

Bob Coles, DMD

Until recently, when a dental patient asked either the dentist or allied dental personnel a question, our ability to answer them in an efficient, thorough and "user-friendly" manner was somewhat limited. We could rely on verbal communication, draw diagrams (perhaps with a dry-erase board), use flip charts, patient brochures and videotapes, or even models of dental appliances, to help get our point across.

Although our list of communication's vehicles would seem to fill every need, in reality these traditional techniques have many shortcomings. They are not only labor-intensive (dental personnel must be present), they are frequently ineffective, making it difficult for dentists to properly educate their patients.

Today, however, with the advent of multimedia presentations designed for the dental environment, patient education can be cost effective, expedient, and efficient. A full range of communication formats can be used to create and display a program that contains illustrations, graphs, photographs, live video footage, written text and labels, narration, music and sound effects, and even computer animation. The possibilities are limited only by the imagination of the producers of the patient education system (PES) that you select for your office, and your budget.

Multimedia presentations are typically available in several formats — including videotape, CD-ROM systems, laser discs and interactive CD-i formats — to create a unique audio and visual program that can be displayed on either a color monitor or conventional television. Today's presentation software allows the transition between the images coming from the various formats to be executed and displayed in a smooth and entertaining manner, rather than the conventional "slide-projector" style, in which each new image is brought up abruptly after the last one has been removed.

Most dentists realize that today's patients need (and want) much more than simple verbal explanations to thoroughly understand our dental procedures and case presentations. For this reason, many dentists have turned to diagrams, flip charts and brochures. But if a picture is worth a thousand words, then surely a live video presentation, with narration, text and computer animation must be worth a million.

Multimedia presentations have existed in the corporate sector for many years, primarily as training and sales tools. Several innovative companies are now applying these teaching aids to the dental field for both clinical (practitioner) and patient education.

While multimedia programs designed to instruct dentists on clinical procedures are now commonplace, the use of similar systems for patient education is fairly new. The potential is enormous. These systems will likely be used primarily in the operatory or consultation room as part of the case presentation, but they have several other valid uses as well. For example, a system placed in the reception area could be used to educate patients about their dental health. In an operatory, a PES system could be used by an assistant or hygienist to provide home-care instruction. Stand-alone systems could also be placed in hospitals, or even at an information centre in a shopping-mall type setting. Again, the uses of these systems are unlimited.

In general, PES follow a similar lay out. Either a mouse, remote control or touch-screen technology is used to select from one of a number of topics from a main menu. Information about each subject is presented in an organized, concise manner, and delivered to a computer monitor or conventional television screen. Following each presentation the user is prompted to select another topic or to replay the last segment. The PES unit may also be programmed to continue playing new topics if no selection is made.

Hardware, although it varies between systems, is usually similar in price and space requirements. The "player" unit — usually the size of a VCR — is used in conjunction with a TV monitor to display each segment. Most presentations are about two minutes long — some are as short as 30 seconds, and others run for seven or eight minutes.

Case Presentation

In either the operatory or consultation room, multimedia education systems have a number of benefits.

1. Standardization: Having a single education system standardizes the way information is presented. A patient will no longer receive one explanation from the dentist, another from a clinical assistant, a third from a hygienist and possibly a forth, entirely different, explanation from the receptionist.

2. Increased Acceptance: Intraoral cameras help patients see, and accept, that they have a problem. A PES will help them understand, and accept, the solution to that problem. Patients with a higher level of dental knowledge and, consequently, a better understanding of specific procedures, are more likely to accept treatment. Brief descriptions and explanations of procedures will remove the "fear of the unknown." An education system also provides an unbiased "second opinion" to build patient confidence.

3. Improved Productivity: Dentists can now be relieved of the obligation to personally educate their patients. The net result is that dentists have more time to perform other tasks. Any questions the patient may have are answered more quickly and effectively, thanks to the self-explanatory nature of the multimedia format. The patient only receives the necessary information required to make informed decisions.

4. Informed Consent: Increased litigation has forced us all to take a different approach to case presentation. After a patient has viewed a specific multimedia presentation, a note can be made in his or her chart to serve as a permanent record of the information that this patient received.

5. Staff Training: Training of new staff can be simplified, and new members can be brought up to speed much more quickly and easily. Each staff member should be encouraged to review the program regularly so that they are able to answer any questions that the patient may have after viewing a presentation.

Hygiene Department

Hygienists and dentists alike will appreciate the PES because it provides patients with improved, yet simplified, education on oral hygiene and periodontal concerns.

1. Improved Understanding: Multimedia is *the* best way to give oral hygiene instruction and explain the progression of periodontal disease.

2. Entertainment/Education: Each segment can be viewed in the same length of time that it takes to administer a fluoride treatment. The patient can be educated, entertained and distracted while the clinical area is being prepared.

3. Improved Relationships: Patients will see that the dentist is going "above and beyond" to help educate his or her patients. This will improve dentist-patient relationships, foster trust, and increase patient retention.

Reception Areas

The patient education system is also a useful addition to the reception area, for several reasons:

1. Increased Awareness: Dentists can introduce new procedures to patients without appearing to be "drumming up business."

2. Increased Productivity: Receptionists are often questioned about clinical procedures, even though they may be the least knowledgeable in these areas. Often patients avoid asking the clinical staff questions because they think that staff are too busy and that the receptionist has more time to spare. However, the reverse is often true. If the receptionist directs the patient to a PES in the waiting area, the patient can receive more thorough and accurate information, and is able to review the same topic repeatedly, if necessary. This frees up the receptionist for other duties.

3. Education/Entertainment: Again, the patient can be educated, entertained and constructively distracted while waiting for their appointment. Few patients will be able to resist watching and interacting with these systems.

General Considerations

The benefits of PES extend well beyond patient education. By using PES, the practice will also enhance its:

1. Internal Marketing: Dental economics dictate that marketing is essential for practice survival. Internal marketing — providing increased and more comprehensive treatments for existing clientele — is the most efficient and cost effective way to market.

2. External Marketing: Patients can't help but tell other people about their experience with multimedia programs in a dental setting. Educated, satisfied patients are the cornerstone of a solid referral network.

3. The "WOW" Factor: Dentists who use new technology will always be perceived as superior, and the care they provide will be considered to be of higher quality. Patients like to believe that their dentist is up-to-date and using leading edge technology; the intraoral camera is a shining example of this trend.

The advantages and possible uses of PES are endless. Patient education has always been a difficult and time-consuming task. Now dentistry has an effective and efficient way to improve both patient care and the bottom line. Multimedia patient education systems are proving to be the next "must-have" tool in the dental environment. ■

Dr. Bob Coles is in private practice in Surrey, B.C. He is also the president of Platinum Interactive Education Systems Ltd., which has developed and is currently marketing a multimedia patient education system.

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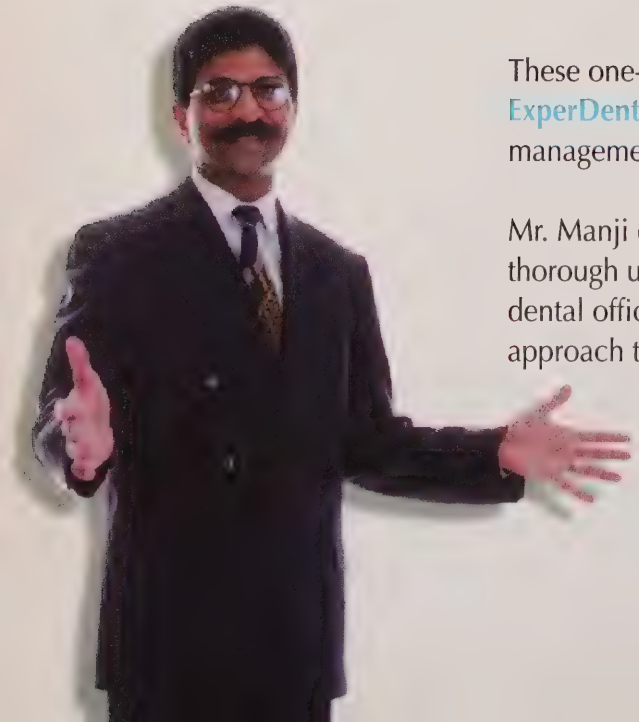

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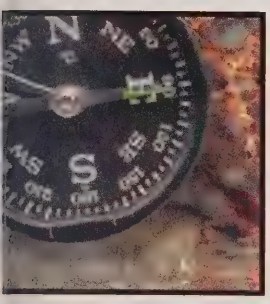

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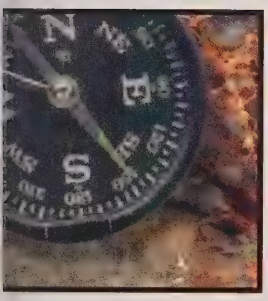
Marketing Strategies to Bring in New Patients... and Keep Them!

As dentistry becomes a service largely paid for by consumers, maintaining income levels and patient flow will increasingly depend on the marketing activities of individual practitioners.

It comes as a pleasant surprise to many dentists that they don't have to become salespeople to market their practices effectively. In fact, dental marketing has everything to do with communicating – and good communications is a worthy goal for every practice.

If you want to attract patients and keep them in your practice, regardless of insurance, this seminar is for you.



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How to Get Ahead and Stay Ahead in Competitive Times!

Competition in dentistry is not the practice down the block. It is the thousands of other companies, products and services that consume your patients' discretionary income – income that is needed to pay for dental treatments. Tough times mean that patients have to make tough choices that directly affect your practice. Learn how to manage your practice to protect your bottom line, maximize practice value and achieve unprecedented success during economic squeezes.

This seminar provides a wealth of practical advice and techniques to anyone concerned about declining incomes, rising costs and limited resources. Your lawyer, accountant or other professional advisors are welcome to attend with you.

SEMINARS

CANADIAN DENTAL ASSOCIATION

SEMINARS '95

SCHEDULE AND REGISTRATION

SEMINAR	LOCATION	DATE
~~Surviving and Thriving~~	~~Winnipeg~~	~~May 5~~
~~Surviving and Thriving~~	~~Saskatoon~~	~~May 12~~
~~Reaching Out~~	~~Vancouver~~	~~June 9*~~
~~Surviving and Thriving~~	~~London~~	~~June 23~~
~~The Bottom Line~~	~~Victoria~~	~~October 13~~
~~The Bottom Line~~	~~Toronto~~	~~November 10~~
~~Reaching Out~~	~~Halifax~~	~~November 17~~
~~The Bottom Line~~	~~Fredericton~~	~~November 18~~
~~The Bottom Line~~	~~Ottawa~~	~~December 1~~
~~Reaching Out~~	~~Calgary~~	~~January 19, 1996~~
~~The Bottom Line~~	~~Edmonton~~	~~January 20~~
~~Reaching Out~~	~~Sudbury~~	~~January 26~~
~~Reaching Out~~	~~Windsor~~	~~February 2~~
~~Reaching Out~~	~~Toronto~~	~~February 9~~
~~Reaching Out~~	~~Montreal~~	~~February 16**~~
The Bottom Line	Saskatoon	March 1
The Bottom Line	Winnipeg	March 29
The Bottom Line	Vancouver	June 14

Agenda **8:30:** Sign-in • **9:00:** Begin • **12:15:** Break • **1:15:** Resume • **4:00:** Close

SEMINAR: _____

LOCATION: _____

	Number	Total
DENTIST/ADVISOR $160 (Lunch included)		
TEAM MEMBER/SPOUSE attending with dentist $80 (Lunch included)		$
SUBTOTAL		$
GST 7% OF SUBTOTAL (#R106845209)		$
TOTAL		$

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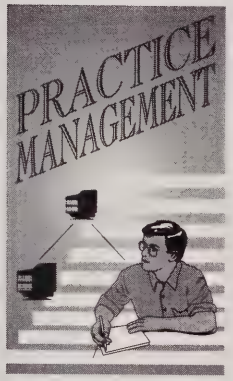

Indebtedness of Dental School Graduates in Canada: Mortgaged Futures

Ray E. McDermott, DDS, M.Sc.
Kevin P. Fuglerud, B.Comm.

ABSTRACT

The debt level of graduating dental students is increasing annually. Six of Canada's 10 dental schools responded to a survey designed to ascertain the level of student debt on entering and graduating from dental school. For the academic year 1993-94, the average starting debt for students was $2,013.89 and the average graduating debt was $25,671.30. On average, dental students accumulated more than $23,600 in debt while pursuing their dental education. Of those students who completed the survey, 57.89 per cent relied on their parents for assistance, and 76.69 per cent received student/government loans. The level of student debt was independent of age, gender and parents' income.

SOMMAIRE

La dette des diplômés en dentisterie augmente chaque année. Six des dix écoles de dentisterie du Canada ont participé à un sondage pour déterminer la dette des étudiants au début et à la fin de leurs études. Pour l'année universitaire 1993-1994, la dette moyenne s'élevait à 2013,89 $ par étudiant au début et à 25 671,30 $ à la fin. En moyenne, les étudiants en dentisterie ont accumulé une dette supérieure à 23 600 $ durant leurs études. Parmi les sondés, 57,89 p. cent comptaient sur l'aide de leurs parents et 76,69 p. cent recevaient des prêts étudiants ou du gouvernement. Ces statistiques ne tenaient compte ni de l'âge et du sexe des étudiants, ni du revenu de leurs parents.

Introduction

The cost of obtaining a dental degree in the United States is rising dramatically. Recent figures released by the American Association of Dental Schools indicate that nearly 84 per cent of U.S. dental students received financial aid in the 1992-93 academic year. On average, the annual aid received per student was $20,610 (U.S.), while the average first-year cost of a dental education was $25,006 (U.S.).[1] The average debt carried by graduates of American dental schools in 1992 was $55,550 (U.S.). Forty-eight per cent of these graduates had debt loads greater than $50,000 (U.S.) and 60 per cent reported being financially dependent on their parents.[2]

In order to ascertain the debt load of Canadian dental students, the University of Saskatchewan's 1992, 1993 and 1994 graduating classes were surveyed. The universities of McGill, Manitoba, Western Ontario, Toronto and Laval participated in the 1994 survey.

The design of the survey forms, and the questions included, were based on similar surveys conducted annually since 1978 by the American Association of Dental Schools. The information obtained is presented in tables and shown as percentages of the number of valid forms returned. This allows comparisons with the results of the American schools.

Table I shows the distribution of the students' financial indebtedness when they entered dental school, and **Table II** shows their debt level on leaving dental school. For the 1994 graduating class of all six schools, the mean percentage of students who began their dental education with no debt was 60.0 per cent. By graduation, only 13.6 per cent were free of debt. The mean level of debt on entering dental school was $2,500, while the average graduating debt was $25,113.64 — a tenfold increase. No students reported total debts of greater than $30,000 on entering dental school, but 2.31 per cent had a debt level of more than $20,000. **Fig. 1** shows the average debt carried by students at the various schools in dollar values.

Table III shows the average graduate's indebtedness (by school) on entering and leaving dental school, and the amount of debt accumulated while pursuing a dental education. The average accumulated debt of the students in the six dental schools surveyed was $22,613. **Table IV** shows the students' sources of financial support during their undergraduate years. Government student loans

Table I

Student Debt Upon Entering Dental School — shown in percentages.

Level of Debt ($)	1992	1993	1994					
	Sask.	Sask.	Sask.	McGill	Manitoba	Western	Toronto	Laval
0	94.4	69.2	55.0	45.5	41.7	57.1	77.3	50.0
1 - 4,999	—	—	15.0	54.5	33.3	33.3	13.6	22.7
5,000 - 9,999	—	15.4	20.0	—	16.7	9.5	4.5	9.1
10,000 - 14,999	—	—	5.0	—	—	—	4.5	9.1
15,000 - 19,999	5.6	15.4	5.0	—	—	—	—	—
20,000 - 24,999	—	—	—	—	—	—	—	—
25,000 - 29,999	—	—	—	—	8.3	—	—	—
30,000 - 34,999	—	—	—	—	—	—	—	9.1
> 60,000	—	—	—	—	—	—	—	—
Average Entering Debt	$3,333	$5,576	$3,375	$1,363	$3,958	$1,547	$1,250	$4,886

Average entering debt for all schools in 1994 = $2,500.

Table II

Student Debt Upon Leaving Dental School — shown in percentages.

Level of Debt ($)	1992	1993	1994					
	Sask.	Sask.	Sask.	McGill	Manitoba	Western	Toronto	Laval
0	16.7	7.7	10.0	9.1	8.3	9.5	20.5	12.5
1 - 4,999	—	—	—	—	8.3	—	—	4.2
5,000 - 9,999	5.6	—	5.0	9.1	8.3	4.8	4.5	4.2
10,000 - 14,999	—	7.7	5.0	27.3	—	—	4.5	—
15,000 - 19,999	5.6	15.4	5.0	18.2	16.7	9.5	9.1	29.2
20,000 - 24,999	5.6	—	5.0	18.2	8.3	9.5	20.5	12.5
25,000 - 29,999	—	15.4	20.0	—	25.0	19.0	6.8	8.3
30,000 - 34,999	11.1	—	—	—	—	9.5	18.2	—
35,000 - 39,999	16.7	—	10.0	9.1	—	9.5	9.1	12.5
40,000 - 44,999	27.7	—	5.0	9.1	16.7	14.3	2.3	12.5
45,000 - 49,999	5.6	—	5.0	—	—	—	4.5	4.2
50,000 - 54,999	—	23.1	10.0	—	—	4.8	—	—
55,000 - 59,999	—	—	—	—	8.3	—	—	—
> 60,000	5.6	7.7	20.0	—	—	9.5	—	—
Average Leaving Debt	$31,111	$32,500	$34,500	$18,636	$24,375	$30,595	$21,420	$22,604

Average leaving debt for all schools in 1994 = $25,113.64.

were received by 76.7 per cent of dental students, and 57.9 per cent relied on help from their parents. In addition, scholarships and bursaries were received by 41.4 per cent of students, and 53.4 per cent relied on part-time employment to help finance their dental education.

In all, 89.47 per cent of graduates reported that they intended to repay their student loans from monies generated through the practise of dentistry, while 4.51 per cent said they would need to consolidate their existing loans to extend their repayment period and reduce the dollar amount of their monthly payments.

The financial indebtedness of dental school graduates relative to their parents' combined annual income is shown in **Table V**, as well as the mean age of students in each debt category. **Table VI**

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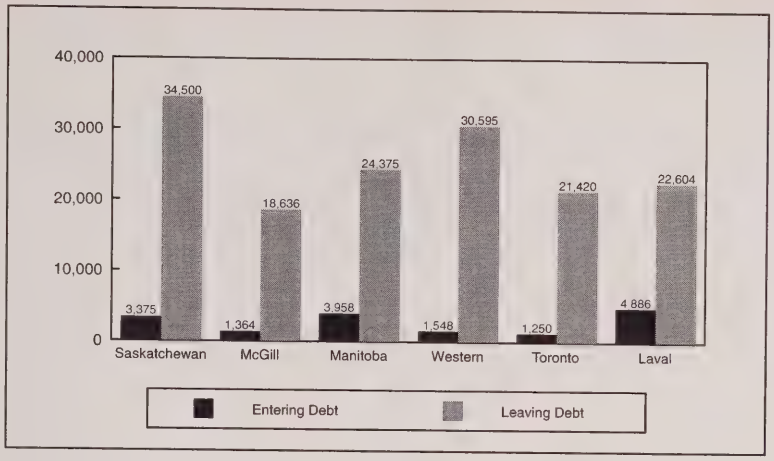

Fig. 1: Average entering and leaving debt (1994), in dollars.

Table III

Average Student's Indebtedness By School

School	Entering Debt	Leaving Debt	Accumulated Debt
Saskatchewan	$3,375	$34,500	$31,125
McGill	$1,363	$18,636	$17,273
Manitoba	$3,958	$24,375	$20,417
Western	$1,547	$30,595	$29,048
Toronto	$1,250	$21,420	$20,170
Laval	$4,886	$22,604	$17,718
All Schools	$2,500	$25,113	$22,613

shows the students' mean indebtedness and age relative to their financial dependence on their parents. As can be seen from these tables, there was no correlation between the level of debt and level of parents' income or the age of the students. However, older students were more likely to report being independent of their parents, and those students who reported being 100 per cent dependent on their parents during dental school also reported the lowest level of debt on graduation.

Three-quarters (75 per cent) of respondents indicated that they would seek an associateship. Only 3.7 per cent of graduates anticipated entering private practice in an entrepreneurial capacity, such as solo practice, a partnership, or a cost-sharing arrangement immediately after leaving dental school.

Close to half of the respondents (46.7 per cent) anticipated practising in a city with a population of more than 500,000 within five years after their graduation, while 27.6 per cent said that they intended to locate in smaller towns or cities having a population less than 100,000. The latter choice was more common among graduates from the universities of Saskatchewan and Manitoba — perhaps because there are fewer large cities in these provinces. **Table VII** shows the impact of financial implications on the graduates' choice of practice locations. Almost half of the respondents (47.2 per cent) said that their present financial situation would not affect their selection of a future practice location.

Orthodontics and oral and maxillofacial surgery were the dental specialties of choice for the majority of graduates who reported an interest in attending graduate school in future years. Of these, 35.3 per cent chose orthodontics

Table IV

Sources of Financial Support — shown in percentages.

Source	Sask.	McGill	Manitoba	Western	Toronto	Laval	All Schools
Parents	60.0	54.5	16.7	81.0	61.4	52.0	57.9
Spouse	25.0	9.1	8.3	4.8	9.1	16.0	12.0
Loans from family	25.0	27.3	16.7	19.0	9.1	12.0	15.8
Loans — non-family	5.0	—	—	9.5	—	—	2.3
Student/Government Loans	75.0	90.9	50.0	90.5	75.0	76.0	76.7
Bank Loans (excludes students loans)	35.0	36.4	16.7	57.1	4.5	36.0	27.1
Scholarships/Bursaries	55.0	54.5	50.0	52.4	31.8	28.0	41.4
Part-time employment	50.0	63.6	50.0	42.9	61.4	48.0	53.4
Armed Forces	15.0	—	25.0	—	—	4.0	5.3
Other	15.0	—	8.3	9.5	4.5	4.0	6.8

Table V

Average Student Debt By Age and By Parents' Income

Parents' Income	Mean Entering Debt	Mean Debts From Dental School Expenses	Mean Total Debt Upon Graduation	Mean Age of Students (in Years)
< $10,000	$2,000	$23,500	$25,500	29.60
$10,000 - $19,999	$1,250	$27,500	$28,750	24.75
$20,000 - $29,999	$3,125	$23,750	$26,875	25.25
$30,000 - $39,999	$1,667	$9,166	$10,833	27.83
$40,000 - $49,999	$1,500	$21,500	$23,000	25.40
$50,000 - $59,999	$5,000	$22,667	$27,667	25.20
$60,000 - $69,999	$2,778	$16,666	$19,444	25.13
$70,000 - $79,999	$1,538	$24,039	$25,577	25.69
$80,000 - $89,999	$1,071	$26,786	$27,857	24.29
$90,000 - $99,999	$2,500	$25,000	$27,500	26.33
> $100,000	$375	$24,208	$24,583	25.42

and 20.6 per cent chose oral and maxillofacial surgery.

The mean age of all survey respondents was 25.98 years, and 35.5 per cent of respondents were female.

Discussion

As can be seen from the information presented, the cost of obtaining a dental education in Canada is considerable and rising. Successive surveys at the University of Saskatchewan indicate that the debt load of graduating students increased from an average of $31,111 in 1992, to $32,500 in 1993, and to $34,500 in 1994.

The American Association of Dental Schools has monitored the educational debt of dental students since 1978, using the annual Survey of Dental Seniors. This survey also indicates that the average indebtedness of graduating dental students has increased annually,[3] reaching an average of $59,387 (U.S.) in current dollars in 1993. As a result, the real cost of a dental education in the U.S., after adjusting for inflation, has more than doubled in the past 20 years. For most of the past decade, tuition has increased annually at a rate that is about two per cent above the Consumer Price Index. Since 1979, the average debt of students graduating from private dental schools in the United States has quadrupled from $20,000 to $80,000. This amounts to almost a 100 per cent increase in real dollar terms, a trend which has occurred in both public and private schools.[4,5] The Saskatchewan data reveals a similar trend in Canadian dental schools.

Table VIII shows tuition fees and the annual percentage increases at the University of Sas-

Table VI

Average Student Debt, Student Age, and Parents' Income by Financial Independence

	Mean Entering Debt	Mean Debts From Dental School Expenses	Mean Total Debt Upon Graduation	Mean Age of Students (in Years)	Mean Parents' Income
Financially Independent of Parents	$3,581	$25,348	$28,929	28.09	$58,143
Financially Dependent on Parents	$978	$21,632	$22,610	24.87	$68,333
Did not Answer	$7,500	$32,500	$40,000	28.00	$75,000
< 10% Dependent	$1,250	$33,611	$34,861	24.78	$67,667
25% Dependent	$1,667	$25,000	$26,667	24.45	$71,250
50% Dependent	$1,094	$21,562	$22,656	25.38	$64,333
75% Dependent	$682	$15,000	$15,682	24.55	$62,273

Table VII

Financial Implications on Choice of Practice Location

Implication	Sask.	McGill	Manitoba	Western	Toronto	Laval	All Schools
Considerable	20.0	10.0	8.3	14.3	25.6	—	18.9
Some Influence	25.0	30.0	58.3	19.0	39.5	—	34.0
No Influence	55.0	60.0	33.3	66.7	34.9	—	47.2

Table VIII

Tuition Fee Increases at the University of Saskatchewan for the Academic Years 1983-84 to 1995-96.

Year	Tuition Fee	Per Cent Increase	Cumulative Increase (per cent)
1983-84	$1,285	—	—
1984-85	$1,390	8.17	8.17
1985-86	$1,500	7.91	16.73
1986-87	$1,590	6.00	23.74
1987-88	$1,750	10.06	36.19
1988-89	$1,890	8.00	47.08
1989-90	$1,985	5.03	54.47
1990-91	$2,184	10.03	69.96
1991-92	$3,203	46.66	149.26
1992-93	$3,623	13.11	181.95
1993-94	$3,990	10.13	210.51
1994-95	$4,253	6.59	230.97
1995-96	$4,463	4.94	247.32

katchewan over the past 13 years, beginning with the 1983-84 academic year. The 46.66 per cent increase in the 1991-92 tuition fees relates to the university's decision to charge differential fees to various colleges, based on the future earning ability of the graduates. Over the 13 years shown in **Table VIII**, the per-year tuition costs of dental students have risen by 247 per cent. These costs do not include instrument fees, incidental student fees, or the costs of food and shelter.

As shown previously, the response rate varied among the schools from a low of 45.8 per cent to a high of 100 per cent. Since completion of the survey forms was voluntary and, of necessity, anonymous, no follow up procedures were possible. These factors should be kept in mind when considering the results.

Conclusions

As a result of overspending by the federal and provincial governments over the past 20 years, government debt levels have continued to rise. Consequently, all levels of government are struggling to reduce the size of their annual deficits by down-loading the costs of many programs, including post-secondary education. Most North American universities have had their level of public funding reduced, with a concomitant reduction to the base operating budgets of dental schools. This has resulted in a loss of faculty and staff positions, and an increase in the tuition and ancillary fees charged to students.

Since the cost per student of operating a professional school is higher than the cost per student to provide a general arts education, some universities have introduced differential fees for various programs. At the University of Saskatchewan, for example, the differentials (or multipliers) are: law, 1.1; veterinary medicine, 1.5; and dentistry and medicine, 1.75. The annual tuition for each of these programs is determined by multiplying its differential and the normal school fee of $85 per credit unit. Even when differentials are applied, however, many student organizations maintain that students in non-professional programs are subsidizing the higher-cost programs offered by the professional colleges. In recent years, the dental programs at the universities of Alberta, McGill and Saskatchewan have been threatened with closure as a result of fiscal cutbacks, and their high cost per student. As a result, the dentistry program at the University of Alberta is being integrated into the medical school, with this integration to be complete by the beginning of the 1996-97 academic year.

This study parallels those conducted by the American Association of Dental Schools and shows similar results. The cost to students, and their parents, of obtaining a dental education are rising. University students and their parents have always scrimped and saved to pay for an education, but increasingly it is being purchased on the instalment plan — a trend that affects the graduates' ability to purchase cars, homes and other goods that drive the economy of the provinces and the country.

The American Council on Education, which represents all post-secondary education in the United States, reports that from 1992-93 to 1993-94, the U.S. federal loan volume rose by 57 per cent and, of the $183 billion (U.S.) paid to students since the U.S.'s federal assistance program began in 1966, 20

per cent was borrowed in the last two years.[6] These increasing costs have implications for the dental profession.

The Health Education Assistance Loan Program, established by the U.S. Department of Health and Human Services in 1979 as a last resort loan for students studying health profession disciplines, reports that in 1994, 3,900 people were in default on student loans amounting to a total of about $200 million (U.S.). Dentists are reported to have the third highest total rate of default at $73 million (U.S.), or 20 per cent of the total.[7]

The question arises: what level of debt can a young graduate dentist carry? What level of monthly payments can he or she handle while attempting to establish a home and a family, and how many years will it take for repayment of his or her student loans?

Student debt has risen to levels that could discourage graduates from becoming full-time faculty members of dental schools, particularly when academic salaries have not kept pace with the real increase in private practice incomes. If this trend continues, dental education and research careers will become increasingly less attractive, particularly for those students with high debt loads on graduation.[5] In fact, if the level of student indebtedness continues to rise, dentistry could become a profession that is attainable only by an elite group whose financial circumstances allow them to pursue a dental education. With the current economic climate in Canada, it would appear that this outcome could well be inevitable. ■

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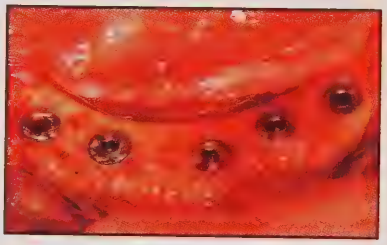

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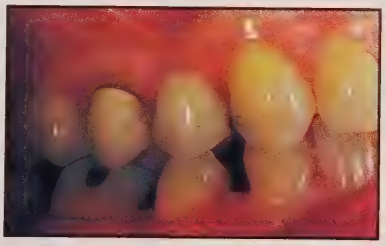

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Chemical Burns Of The Oral Mucosa: Report Of A Case

Shari R. Isenberg, DDS
Lawrence A. Hier, DDS
Peter J. Chauvin, DDS, M.Sc., FRCD(C)

ABSTRACT

Clinical diagnosis of a chemical burn of the oral mucous membranes may be a diagnostic challenge. This article's intent is to illustrate the typical appearance of a chemical mucosal burn and to increase awareness of the various compounds which, when in contact with the mucous membranes, can result in a burn.

The authors present a case involving a self-inflicted chemical injury of the oral mucous membranes and illustrate how the submission of an easily-obtained tissue specimen for pathologic examination may aid in the diagnosis. Because these superficial tissues can be obtained and submitted without the need for local anesthetic, pathologic examination is a quick, easy, and valuable diagnostic test when a patient's history is difficult to obtain or intentionally misleading.

SOMMAIRE

Le diagnostic clinique d'une brûlure chimique aux membranes muqueuses de la bouche peut constituer un défi. Dans cet article, on se propose de démontrer comment se présente ordinairement une brûlure de ce genre et d'expliquer les divers composés qui, lorsqu'ils entrent en contact avec les muqueuses de la bouche, peuvent causer des brûlures.

On présente le cas d'une personne qui s'est infligée elle-même une brûlure chimique aux muqueuses de la bouche et on explique comment la présentation d'un prélèvement tissulaire facile à obtenir peut aider à formuler le diagnostic. Parce que ces tissus superficiels peuvent être prélevés et présentés sans avoir besoin de recourir à une anesthésie locale, un examen pathologique est un test diagnostique facile, rapide et utile lorsqu'il est difficile d'obtenir l'histoire médicale d'un patient ou que celle-ci est intentionnellement trompeuse.

Introduction

This article was written to make clinicians more aware of the caustic substances that can cause chemical burns in the oral cavity. Burns of the oral cavity can result from brief or prolonged exposure of the mucous membranes to a host of noxious physical or chemical elements. This exposure can be intentional or accidental, and initiated by the clinician or the patient.

Mucosal burns typically occur when the mucosal tissues come into contact with food that has been heated to extreme temperatures. A good example of this is the palatal burn caused by the mucosal tissues contacting the hot cheese on a pizza. However, therapeutic external beam radiation, electricity, and exposure to caustic chemicals such as acids, alkalines and alcohols can also result in mucosal burns.

Dentists use or prescribe many materials and/or medications that are caustic. Various chemicals, including dental cavity varnish,[1] dentin bonding agents,[2] sodium hypochlorite,[3] phosphoric acid-etching solutions and gels,[4] have been reported to cause mucosal burns. The use of a rubber dam and careful handling of all chemicals, as well as frequent cleansing of the oral cavity with air-water spray and high-speed suction, should reduce these iatrogenic injuries.

Patients may accidentally or intentionally subject their mucous membranes to an unimaginable variety of caustic substances, including sodium perborate, hydrogen peroxide, gasoline, turpentine, rubbing alcohol and battery acid.[5] However, mucosal burns are more commonly caused by uninformed patients holding an aspirin tablet (acetylsalicylic acid) against the

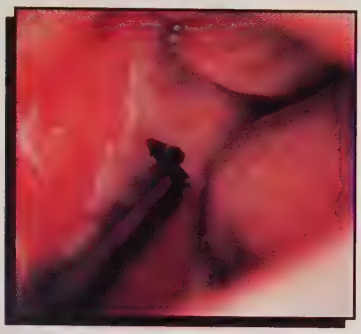

Fig. 1: *Clinical photograph of the thick white lesion affecting the right buccal mucosa. The superficial tissue layers could easily be peeled away by gentle traction with tissue forceps.*

Fig. 2: *Clinical photograph of the remainder of the white lesion. Note the erythematous exposed underlying tissue surface.*

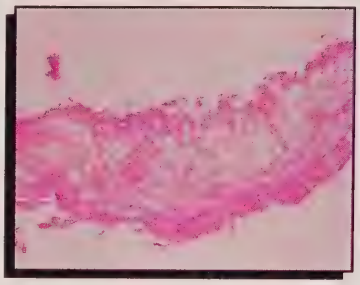

Fig. 3: *Low power photomicrograph demonstrating an irregular strip of epithelium with loss of cell nuclei and increased eosinophilia of cells. Note no basal cell layer is present. (Hematoxylin and eosin stain.*

gingiva to relieve toothache,[6] or by children retaining chewable aspirin in the oral cavity.[7]

Children may accidentally ingest almost any available caustic substance — including cosmetics such as alkaline hair relaxer — resulting in oral mucosal burns.[8] In these cases, children should be immediately referred to a pediatric centre for management, including possible endoscopic examination of the upper gastrointestinal tract.[9]

Hydrogen peroxide, used at concentrations of three per cent or greater, can result in mucosal damage, although some reactions have been reported at concentrations as low as one per cent.[10] The overuse of some brands of dentifrice and over-the-counter mouth rinses containing alcohol can also cause superficial mucosal burns, which are usually associated with a sloughing or peeling of tissues.[4] Similarly, many of the over-the-counter medications suggested for the treatment of oral ulcers can, due to their caustic nature, worsen mucosal damage. The inappropriate use of silver nitrate sticks — used to treat aphthous ulcers — has also caused unnecessary suffering, due to the resulting tissue necrosis.[11]

Although chemical burns of the oral mucosa can occur in any location, keratinized tissues are more resistant to burns compared to non-keratinized movable mucous membranes. The clinical appearance of a chemical burn is fairly uniform, and is related to the severity of tissue damage. A mild chemical burn exhibits a superficial, white, wrinkled appearance. More severe mucosal burns exhibit a shaggy white necrotic appearance, with separation of the overlying epithelium from the underlying connective tissue. Removal of the necrotic superficial tissues reveals a red, sometimes bleeding, base.

The chemical burn case described below was encountered in the student clinic. This case illustrates the common clinical and histopathological findings of a chemical mucosal burn, and how the submission of a superficial tissue specimen for pathologic examination can aid in the diagnosis of cases in which an accurate patient history is not possible, such as in facticial injuries.

Case Report

A 67-year-old caucasian woman who had recently emigrated from Poland was seen for a preprosthetic evaluation in the student clinic at the Montreal General Hospital. Communication with the patient was difficult due to language differences, but the patient was able to indicate that she wanted "new dentures." Her medical history was non-contributory, except for a several-year history of osteoarthritis. She did not report taking any medications.

Clinical examination revealed a well-nourished, well-developed, asymptomatic edentulous patient with mild mandibular and maxillary alveolar ridge resorption. She had loose-fitting complete upper and lower dentures. The oral mucous membranes appeared normal, except for a prominent thick white plaque affecting the entire right buccal mucosa. With gentle retraction, using tissue forceps, a superficial layer of white tissue could be peeled away, leaving a red undersurface (**Figs. 1** and **2**). The patient was unaware of the lesion and denied the application of aspirin or other substances to the area. The removed tissue was submitted in 10 per cent neutral buffered formalin for histopathologic examination, with the following clinical differential diagnosis:

- mucosal burn
- acute pseudomembranous candidiasis
- cicatricial pemphigoid

Histologic examination revealed strips of squamous epithelium exhibiting focal coagulative necrosis. No basal cell layer or underlying connective tissue was present (**Fig. 3**), and special stains failed to reveal fungae. These histologic changes are consistent with a mucosal burn.

The patient was seen for follow-up one week later. With the assistance of a Polish interpreter, she

admitted that she had experienced some discomfort of the right buccal mucosa and had repeatedly applied a liniment inside her cheek for relief. She justified her actions with the loosely translated statement: "What's good for the hip must be good for the mouth." The patient produced a bottle of Minard's Liniment (SmithKline Beecham Pharma Inc., Weston, Ontario) which she used for relief from arthritic hip pain. As listed on the container, Minard's liniment contains: camphor, 5.45 per cent; ammonia, 3.5 per cent; and turpentine, 10.5 W/W.

The patient was advised to discontinue using the liniment in her oral cavity, and at two-week follow-up the oral mucous had returned to normal.

Discussion

The majority of chemical burns of the oral mucosa are unintentionally self-inflicted. In the majority of cases, they are caused by patients holding aspirin in their mouth in an attempt to alleviate toothache. Oral mucosal burns can be prevented through improved patient education and careful handling of caustic materials by the clinician.

Accidental mucosal burns must be quickly identified by the clinician so that the initiating agent can be removed. In most instances, the oral mucous membranes will heal and return to normal within 10 days to two weeks after the removal of the causative agent. The patient usually requires little treatment, except for palliation. In addition to analgesics such as acetaminophen, the application of a paste containing carboxymethylcellulose, such as Orabase (Bristol Myers Squibb Canada Inc., Montreal, Quebec), or a diluted topical anesthetic may also offer some relief.[12]

The clinical appearance of mucosal burns is usually suggestive, but a patient history is of paramount importance. Mucosal burns with a clean tissue separation may lure the clinician into a differential diagnosis that includes vesiculobullous disorders such as cicatricial pemphigoid, pemphigus vulgaris and bullous lichen planus. The submission of an easily-separated superficial tissue specimen for pathologic examination is a useful aid in the diagnosis of a mucosal burn, especially in the case of suspected facticial injuries. Special stains may be performed on the tissue submitted, and a periodic acid Schiff stain may be used to detect fungal pseudohyphae of Candida species. Direct immunofluorescence can also be performed on superficial strips of epithelium, and can be useful in the diagnosis of cicatricial pemphigoid. As direct immunofluorescence for the detection of tissue-bound antibodies cannot be performed on formalin-fixed tissues, two tissue samples should be submitted when immunofluorescence is clinically indicated, one in Michel's transport medium and the other in 10 per cent neutral buffered formalin.[13]

A full-thickness biopsy should be performed in cases of suspected epithelial dysplasia, malignancy, and inflammatory disorders requiring examination of the epithelial connective tissue interface.

In conclusion, oral mucosal burns are best prevented by patient and clinician education. The submission of easily obtained superficial tissues may confirm or establish the diagnosis of a mucosal burn in cases where an accurate patient history is difficult to obtain or intentionally misleading. ■

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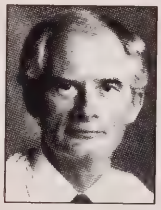

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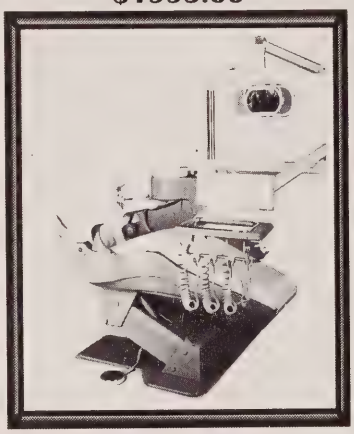

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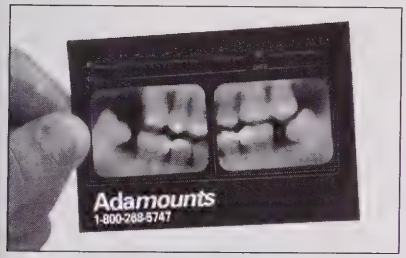

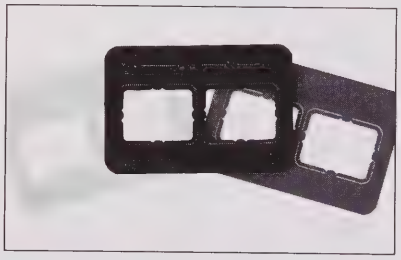

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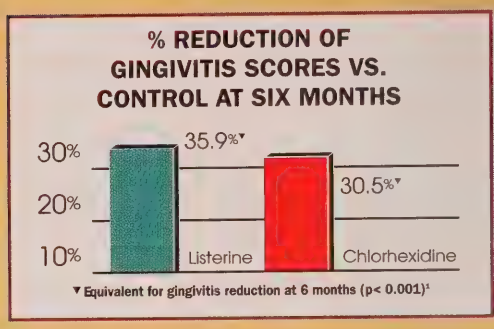

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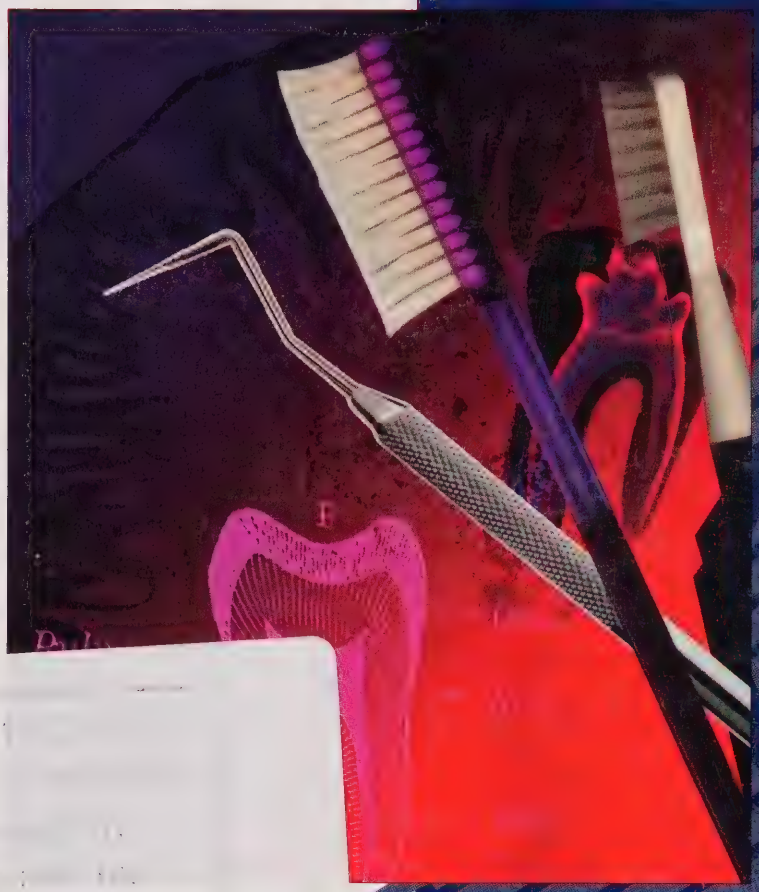

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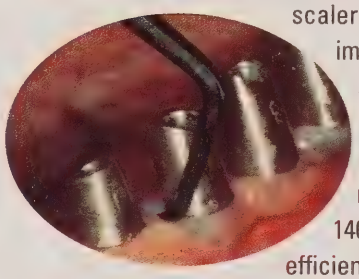

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Canadian Dental Association/
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APRIL / AVRIL 1996
VOL. 62, NO. 4

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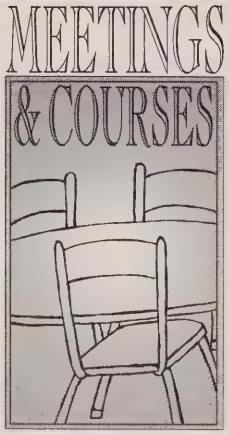


INTERNATIONAL

May 5-8

5th Congress Of The International Society for Lasers In Dentistry in Jerusalem, Israel. Contact the ISLD, P.O. Box 50006, Tel Aviv, 61500, Israel. Tel.: 972 3 5140000, or fax: 972 3 5174674 or 972 3 5140077.

May 16-18

British Dental Association Conference in Edinburgh. Contact the British Dental Association, Conference Office, 64 Wimpole St., London W1M 9AL. Tel.: 0171 935 0875, or fax: 0171 486 0855.

May 30 — June 1

Satellite Program '96 — Contemporary Gnathology in The Hague, Netherlands. Co-sponsored by the American Equilibration Society and the Dutch Society for Gnathology. Contact the American Equilibration Society, 9726 North Ferris Ave., Morton Grove, Ill. 60053, U.S.A. Tel.: (708) 965-2888, or fax: (708) 965-4888.

June 18-22

Turkish Dental Association's 3rd International Dental Congress in Ankara, Turkey. Tel: 0 312 479 8924, or fax: 0 312 474 79 25.

July 11-13

International Women's Dental Conference in Melbourne, Australia. "Enhancing the balance both personally and professionally." Contact Amanda Lawrence, 3 Railway Walk, Hampton 31188, Australia. Tel.: (03) 9521 6500, or fax: (03) 9521 6501.

August 10-16

43rd World Congress of Young Dentists Worldwide (YDW) and International Association of Dental Students (IADS) in Göteborg, Sweden. Contact the IADS & YDW Congress Committee, Odontologen, Medicinaregatan 12 a, 8, 413 90 Göteborg, Sweden. Tel.: +46(0)31 773 32 08, or fax: +46(0)31 773 32 07.

August 19-23

21st North Queensland Dental Convention in Cairns, Australia. Contact Peter Martin, North Queensland Dental Convention, P.O. Box 388, Cairns 4870, Australia. Tel.: (070) 51 2351, or fax: (070) 31 2351.

August 21-24

2nd World Congress of Hungarian Dentists in Budapest, Hungary. Contact the Congress office of MATE, Ms. Zsuzsa Pintér, Budapest, P.O.B. 451, H-1372. Tel.: (36-1) 1329-571, or fax: (36-1) 1531-406.

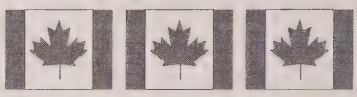
September 4-8

18th Biennial Conference of the New Zealand Dental Association — Tomorrow's Dentistry Today in Rotorua, New Zealand. Contact the NZDA Conference Secretary, Dr. Roger Ayers, 19 Pukaki St., Rotorua, New Zealand. Tel.: +64 7 348 5385, or fax: +64 7 348 6788.

October 5-8

International Conference on Stress and Health — ISMS 6 in Sydney, Australia. Contact F.J. McGuigan, Institute for Stress Management, 10455 Pomerado Rd., San Diego, Calif. 92131. Tel.: (619) 635-4698, or fax: (619) 635-4669. Internet: NOSTRESS@sanac.USIU.edu.

CANADA



May 2

The University of Toronto Class of 1986 — 10-year reunion. Contact Dr. Iris Kivity-Chandler. Tel.: (416) 787-9060, or fax: (416) 709-3905.

May 4

An Overview of Forensic Dentistry. Presenter: Dr. David Sweet. Contact Continuing Education, Faculty of Dentistry, Dalhousie University, Halifax, N.S. B3H 3J5. Tel.: (902) 494-1674, or fax: (902) 494-2527.

May 10-11

Joint meeting of the **Canadian Academy of Periodontology (CAP)** and the **Association of Prosthodontists of Canada (APC)** in Montreal, Que. Contact Dr. Don Kramer (APC), tel.: (416) 597-0839; or Dr. Lorne Wiseman (CAP), tel.: (514) 937-3535.

May 11

Northern Alberta Dental Hygienists Society in Edmonton — Emergency Medicine in Dentistry. Guest speaker: Dr. Stanley Malamed. Contact Glennis or Patricia McIntyre. Tel.: (403) 465-1756, or fax: (403) 440-0554.

May 11

Pediatric Dentistry, 1996: A Renaissance. Presenter: Dr. Theodore Croll. Contact Continuing Education, Faculty of Dentistry, Dalhousie University, Halifax, N.S. B3H 3J5. Tel.: (902) 494-1674, or fax: (902) 494-2527.

June 1

Esthetic Dentistry. Presenter: Dr. William Dickerson. Course co-sponsored with Aurum Ceramic

Dental Laboratories. Contact Continuing Education, Faculty of Dentistry, Dalhousie University, Halifax, Nova Scotia B3H 3J5. Tel.: (902) 494-1674, or fax: (902) 494-2527.

June 6-8

University of Toronto's faculty of dentistry — Root Canal Filling by Vertical Condensation of Warm Gutta-Percha. Contact Continuing Education, Faculty of Dentistry, University of Toronto, 124 Edward St., Toronto, Ont. M5G 1G6. Tel.: (416) 979-4902, ext.: 4389.

June 7-9

Canadian Dental Hygienists' Association 7th Annual Professional Conference — "Interdependence and Independence: Striking a Balance." Contact Janice Edgar. Tel.: (613) 221-5515, or fax (613) 224-7283.

July 6

HIV Prevention Works — a satellite symposium of the XI International Conference on AIDS in Vancouver, B.C. Contact the Canadian Public Health Association, 400-1565 Carling Ave., Ottawa, Ont. K1Z 8R1. Tel.: (613) 725-3769, or fax: (613) 725-9826.

July 23-26

8th International Congress of the International Association of Oral Pathologists in Toronto. Contact the Congress Office, P.O. Box 1570, 190 Railway St., Kingston, Ont. K6L 5C8.

August 17-20

Canadian Dental Association 1996 Convention in Montreal. Scientific sessions, exhibit hall, social events, special activities, spouse's program and children's program. Contact Laura Stephenson. Tel.: (613) 523-1770, ext. 246, 1-800-267-6354, or fax: (613) 523-3062.

August 17-20

Annual Convocation and Meeting of the Canadian Section of the International College of Dentists in Montreal, Que. Contact the Canadian Section of ICD, 12A Yonge Blvd., Suite 1, Toronto, Ont. M5M 3G5.

August 17-22

8th World Congress on Pain in Vancouver, B.C. Sponsored by the International Association for the Study for Pain (IASP). Contact the IASP Secretariat, 909 N.E. 43rd St., Suite 306, Seattle, Wash. 98105, U.S.A. Tel.: (206) 547-6409, or fax: (206) 547-1703.

September 7-8

Royal College of Dentists of Canada Convocation, Annual Dinner and Annual Meeting in Montreal, Que. Contact Kay Montgomery, tel.: (416) 929-2722, or fax: (416) 929-5924.

October 2-6

32nd Annual Meeting of the Canadian Academy of Endodontics in Kelowna, B.C. Contact Dr. W.J. Froese, tel.: (604) 763-0855, or fax: (604) 763-1124.

November 1-2

Southern Ontario Surgical Orthodontic Study Group will meet in Windsor. Contact Dr. Jeff Berger. Tel: (519) 258-2632, or fax: (519) 258-2637.

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May 3-4

15th Annual Academy for Sports Dentistry Symposium in Minneapolis, Minnesota. Featuring orofacial trauma and hands-on mouthguard fabrication workshop. Contact the University of Minnesota, Continuing Dental Education, 6-506 Moos HS Tower, 515 Delaware St. S.E., Minneapolis, Minn. 55455. Tel.: (612) 625-1418.

June 13-16

1996 Annual Symposium of the Office Sterilization and Asepsis Procedures (OSAO) Research Foundation in Dallas, Texas. Contact the OSAP Central Office, P.O. Box 6297, Annapolis, Md. 21401. Tel.: (410) 798-5665 or 1-800-298-6727, or fax: (410) 798-6797.

July 25-27

10th National Conference on the Young Dentist — A Decade of Excellence, in Cleveland, Ohio. Contact the American Dental Association Committee on the New Dentist. Tel.: (312) 440-2779.

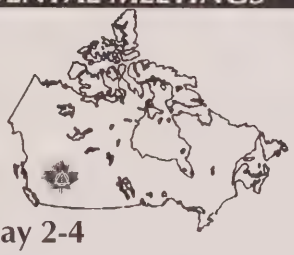
September 25-27

Call for abstracts for the **59th Annual Meeting of the American Association of Public Health Dentistry** in Orlando, Florida. Deadline for submission is May 1, 1996. Contact the AAPHD National Office, 10619 Jousting Lane, Richmond, Va. 23235-8344. Tel.: (804) 272-8344, or fax: (804) 272-0802.

November 4-5

American Board of Oral and Maxillofacial Radiology — 1996 Certifying Examination in San Diego, California. Applications must be received by May 3, 1996. Contact Dr. R. Curtis Lundeen, Oral Radiology, Oregon Health Sciences University, School of Dentistry, 611 S.W. Campus Dr., Portland, Ore. 97201-3097. Tel.: (503) 494-8930.

DENTAL MEETINGS



May 2-4

Ontario Dental Association Annual Spring Meeting in Toronto. Contact Diana Thorneycroft. Tel.: (416) 922-3900, ext. 346, or fax: (416) 922-9005.

May 9-11

Newfoundland Dental Association Annual Meeting in Cornerbrook. Tel.: (709) 579-2362.

May 23-25

Prince Edward Island Dental Association Annual Meeting in Mill River. Contact Dr. Cheryl Wenn. Tel.: (902) 628-8088.

May 25-29

25e Congrès annuel de l'Ordre des dentistes du Québec — Les Journées dentaires in Montreal. Contact Nicole Pagé or Ginette Boutin. Tel.: (514) 875-8511, or fax: (514) 875-1561.

May 31-June 1

New Brunswick Dental Society Annual Meeting in St. Andrews. Tel.: (506) 452-8578.

June 6-9

Alberta Dental Association Annual Meeting and Convention in Kananaskis. Tel.: (403) 432-1012.

June 14, 15

Nova Scotia Dental Association Annual Meeting in Baddeck. Contact Steve Jennex. Tel.: (902) 420-0088.

August 17-20

Annual Meeting of the CDA Board of Governors, in Montreal. Contact Suzanne Burton. Tel. (613) 523-1770, ext. 201, or 1-800-267-6354.

August 17-20

CDA 1996 Convention in Montreal. Contact Laura Stephenson. Tel.: (613) 523-1770, ext. 246, or 1-800-267-6354, or fax (613) 523-3062.

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Cathy Jameson - Team Building
Dr. Douglas Damm - Oral Pathology
Dr. Lawrence Gaum - Oral Surgery
Charlene Sweeney - Systems for Success
Dr. Howard Farran - Business of Dentistry
Dr. Mark Hackbarth - Practice Management
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Reports From Ukraine

I read with interest the News Update story, "Reports From Ukraine," in the February issue of the *Journal* (Vol. 62, No. 2, p. 134, 1996). It always helps to read about dentistry in other parts of the world. This type of article rounds out the content of the *Journal* quite well. Keep up the good work.

Michael A. Lasko, DMD
Winnipeg, Manitoba.

Guideline Development

I read with interest the article by R.G. Stephens et al entitled "Current Trends in Guideline Development: A Cause for Concern" *J Can Dent Assoc* 62(2):151-158, 1996.

I would like to correct a couple of inaccuracies in the article regarding the membership of the National Partnership for Quality in Health (NAPAQH), and the Canadian Medical Association's (CMA) role in the "Evidence-Based Medicine" series.

The publication entitled *Guidelines for Canadian Clinical Practice Guidelines* was based on the proceedings of NAPAQH and CMA's joint 1992 CPG Workshop, which was attended by over 50 national and provincial medical and health organizations and governments. NAPAQH (whose membership includes the CMA, the Association of Canadian Medical Colleges, the Canadian Council on Health Services Accreditation, the College of Family Physicians of Canada, the Federation of Medical Licensing Authorities of Canada, and the Royal College of Physicians and Surgeons of Canada) then refined the proceedings and the resulting document — Guidelines for Canadian Clinical Practice Guidelines — was then endorsed by over 40 organizations which attended the 1992 CPG Workshop.

The Evidence-Based Medicine series published by *CMAJ* in 1994 under the Quality of Care section were actually written independently of CMA by a group under the name of "Evidence-Based Care Resource Group." The members consist of Dr. Andrew Oxman, Dr. David Davis, Dr. John Feightner, Dr. Neil Finnie, Dr. Brian Hutchison, Ms. Sandy Lusk, Dr. Peter MacDonald, Dr. Ron McCauley, and Dr. John Sellors. Dr. Oxman is the chair of the group.

I would appreciate if you could pass these corrections on to the authors and congratulate them on an interesting and timely article.

Sue Beardall, Senior Project Manager, Quality Care Program
Ottawa, Ontario.

Oops!

The cover of the February issue of the *Journal* (Vol. 62, No. 2, 1996) shows a patient receiving a bonded restoration from a dentist and assistant. Rubber dam is used appropriately, but look at all the unprotected pairs of eyes! No safety glasses for dentist or patient, and the assistant appears to be looking directly at the curing light.

This may have been a posed picture for demonstration purposes, but attention to details should not be forgotten.

J. Lynn Tomkins, B.Sc., DDS
Toronto, Ontario.

Editor's Note

Thanks to Dr. Tomkins and the other dentists who pointed out our error and oversight.

New *Journal* Cover

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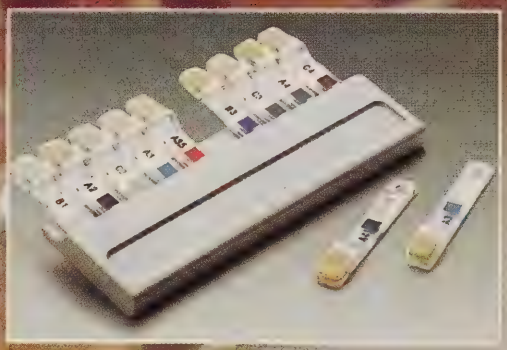

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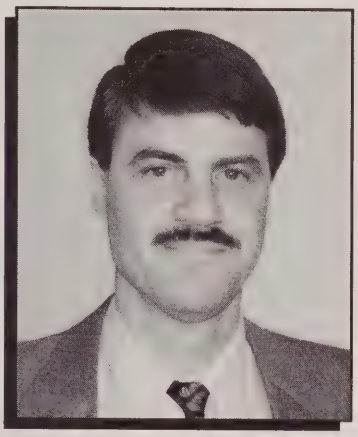
[1] Shiro Suzuki, D.D.S., Ph.D., F.A.D.I., F.A.D.M., "In Vitro Wear of Prisma AP.H and Prisma TPH as opposed to Human Enamel."

Karl F. Leinfelder, D.D.S., M.S., "Clinical Evaluation of Composite Resin System Prisma TPH Final Report."

Ronald Perry, D.M.D., "Clinical Evaluation of TPH/VariGlass™ VLC for restoration of Class II Carious Lesions of Premolars and Permanent Molars."

GUEST EDITORIAL

SECOND GENERATION NoF-NoC'S



Dr. Hardy Limeback

During my last visit to the film processing shop to pick up my NoF-NoC photos, two parent/child pictures caught my eye.

One was a photo of John, a 34-year-old patient of mine, posing with his son Paul, age 6. By looking at the picture, you could see that Paul's right central was half erupted, but you couldn't tell that it had mild fluorosis.

The other photo showed Sarah, age 3, cuddling up to her dad, William, in the dental chair. William had a huge grin on his face.

Both pictures would make "unique" photos for my NoF-NoC bulletin board. But it occurred to me, looking at these photos, that it may be time to put up a new, separate bulletin board in my office. The new board would be reserved for photographs and messages related to an exclusive club of "Two-Generation NoF-NoC Families."

By now, you're probably wondering "what the heck does NoF-NoC mean?" You won't find it in the dictionary. In fact, NoF-NoC is simply a term I've coined to describe all the patients in my practice who are not only caries-free, but also free of restorations. It stands for "No Fillings, No Cavities."

Today, it is not uncommon for children to grow up caries free. But both Sarah and her dad, and Paul and his dad, (patient details were changed to protect identity) are unique because they come from two-generation NoF-NoC families — families with two generations of patients who have never known what it's like to receive local anesthetics, caries restorations or extractions. Like Sarah and Paul, most "second-generation NoF-NoC's" are "post-echo baby boomers" — children whose parents were born in the sixties, the decade that fluoride use really took off.

I like to brag about the NoF-NoCs in my practice, and even to think I contributed to their dental success. In reality, however, I had precious little to do with the level of oral health they now enjoy. Most "30 something" NoF-NoCs were already graduating from high school — with perfect teeth — while I was still in dental school. Despite less than perfect oral hygiene and typically cariogenic Canadian diets, these NoF-NoC's, with their perfect wedding smiles, got married and produced clones with perfect teeth. Why were they so lucky? Simple. Everyone knows it's because of fluoride.

But fluoride can also cause dental fluorosis. Paul's mother was the first to notice that his tooth was erupting with dental fluorosis. I assured her that the white spots would fade with time or disappear altogether if Paul required orthodontics. Unfortunately, there are many young patients in my practice with dental fluorosis severe enough that their parents want me to do something right away. In a handful of cases, the fluorosis is so severe that the parents actually allowed their previous family dentist to treat it with composite resin restorations.

It makes you stop and think. How many NoF-NoC kids are there with restored fluorotic lesions? How many patients have already received microabrasion treatments, vital bleaching, porcelain veneers or, heaven forbid, PBM crowns because of dental fluorosis? Are second generation NoF-NoCs going to be the first generation to start avoiding fluoride? Will these young children, the ones with so much concern for our environment, start to lobby governments to have fluoride removed from city water supplies, toothpastes and dental offices?

It has always been well known, at least by researchers, that fluoride has a narrow therapeutic window. To avoid side effects and still get maximum protection against caries, fluoride exposure has to be well controlled. Health and Environment Canada recently sponsored a thorough review of human exposures to fluoride in Canada. Although the government's official position on fluoride is that there is still little to be concerned about, additional research is warranted so that scientifically-sound public health decisions can be made on the safe use of fluorides, and appropriate advice can be provided to both the dental profession and the public.

This April marks the fourth anniversary of the Canadian Conference On The Evaluation Of The Current Recommendations Concerning Fluorides. While the dental profession should continue to boast about its NoF-NoCs, the recommendations of the workshop should not be ignored. Small children should be supervised during brushing and taught how to rinse and spit out toothpaste. Excessive use of toothpaste at each brushing should be discouraged. Patients with multiple exposure to fluorides (e.g. supplements, fluoridated water, toothpastes, mouthrinses and now even dental floss) should be cautioned not to overdo it. Physicians, nurses, teachers, drug companies, dental product manufacturers and even our federal regulatory bodies should be brought up-to-date with respect to the risks and benefits of fluoride.

During the 50 years that fluoride has been promoted as a means of preventing tooth decay, we have witnessed the birth of not just one but two generations of NoF-NoCs. I only hope the second generation is not the last one.

Hardy Limeback, B.Sc., PhD, DDS
Member, CDA consumer products recognition committee; associate professor and head, preventive department, faculty of dentistry, University of Toronto; private practitioner.

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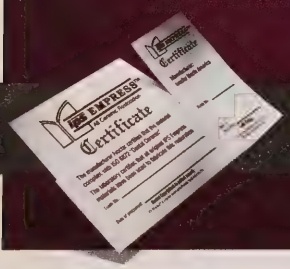

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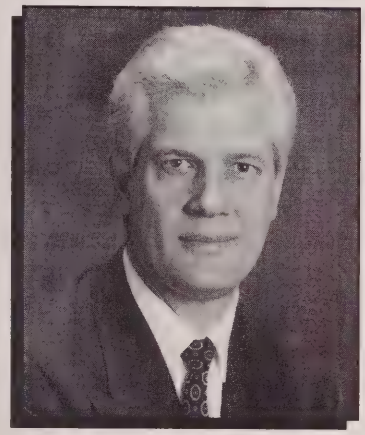

Dr. James R. Brookfield, CDA president.

For the third year in a row, Finance Minister Paul Martin's budget left me with mixed emotions.

Like most Canadians who listened to Mr. Martin's March 6 budget speech, I was elated when it became clear that the tax-free status of employer-sponsored health and dental plan benefit plans would be preserved for another year. At the same time, however, the minister's continued budget day silence on the dental tax issue was a disappointment.

For three straight years, CDA and our corporate members have called on Canadian dentists and their patients to speak out against the taxation of health and dental plans. And they have.

In 1994-95, as a direct result of our award-winning "Enough is Enough" campaign, concerned Canadians sent more than 300,000 no-tax letters to Parliament Hill. This year, despite a more low-key public approach to the issue, and a three-week time frame, more than 180,000 dental patients signed a petition against the taxation of dental plans.

Dentists and their patients have delivered a clear message to Mr. Martin and the Chrétien government: Don't tax dental plans. Unfortunately, the finance minister has not delivered an equally clear response to that message. By remaining silent on the tax issue, he has effectively left it on the table.

This is unfortunate. During the 1994-95 pre-budget consultations, Mr. Martin indicated that he accepted dentistry's health-related arguments in support of tax deductible health and dental plan premiums. His concern was not with the health value of the deduction, he said, but with the fact that it did not apply equally to all Canadians. And he stated quite clearly that if the tax equity issue could not be resolved, he would look seriously at taxing health and dental plans.

Within days of the 1995 budget speech, CDA offered to work with the finance minister and his officials to resolve the equity issue. Unfortunately, our offer, as well as subsequent requests to meet with Mr. Martin and his officials to define the parameters of the problem, were largely ignored. This left CDA in the unenviable position of having to come up with a workable solution to an unspecified problem.

We accepted this all-important challenge. Last year, we worked hand-in-hand with William M. Mercer Ltd. and our partners in the Action Plan Committee for Fair and Supportable Tax Treatment For Health and Dental Programs to initiate independent research on the equity issue.

Today, I can't express just how vital this initiative was. The data gathered by Mercer, and their subsequent report, showed that 25.6 million Canadians, or 87.7 per cent of the population, are covered by some form of government or private supplementary health and dental plan, while a further 1.95 million Canadians qualify for tax-free benefits, but do not receive them from their employers. In other words, there is no equity issue. It simply does not exist.

This finding formed the basis of CDA's pre-budget presentation to the House of Commons Standing Committee On Finance. It was also reflected in the committee's final report to Mr. Martin, which recommended that the government "examine the possibility of allowing self-employed, unincorporated individuals to deduct the premiums of supplementary health and dental coverage." Based on the committee's best estimates, extending the tax deductibility of health and dental plan premiums to this group would cost the government just $35 million per year.

Despite this, Mr. Martin's budget speech was devoid of any reference to health and dental plans. His continued silence is ominous, particularly when officials in his department believe that a premium tax could generate as much as $1.25 billion in new revenues for the government. It also means that CDA and our corporate partners must sustain the no-tax campaign for at least another year.

Canada's unique oral health care delivery system, and all the oral health gains that we've achieved in Canada over the last 25 years, are too important to give up without a fight. And we must carry on this fight with every legal means at our disposal until the finance minister states unequivocally that health and dental plans will not be taxed. It's what our members expect of us, and it's one of the most important things that we can do on their behalf.

CDA continues to call on the finance minister to impose a moratorium on future changes to the tax status of health and dental benefit plans until his department has conducted a comprehensive review of the tax system and how it impacts on all aspects of Canada's health care delivery system. This is the message that we will take to the National Forum on Health later this month, it's the message dentists in our MP-Dentist Contact Program are delivering to members of Parliament, and it's our bottom line.

In coming months, CDA will work closely with our corporate members to achieve this goal. At the same time, we will monitor the impact of Mr. Martin's plans to raise $150 million in new tax revenues by targeting unincorporated businesses and self-employed individuals for increased audit attention by Revenue Canada, and we will continue to work with the RRSP Alliance to preserve equitable RRSP contribution levels for dentists, self-employed individuals, and Canadians who have no opportunity to participate in a registered pension plan.

It promises to be an interesting year.

James R. Brookfield, DDS
President of the Canadian Dental Association

Galileo™ Perfect Approach™ Commentary Number 43

Excerpted from the Galileo™ Treatment Acceptance Training™ Program

What's At Stake

I'm not a Dentist. But I know Dentists. And I know what's happening to Dentists in North America today. You are being asked to retire. Retire early. Retire now. At least as far as owning your own business. You are being asked to abandon your independent status to become part of the "corporate culture", because of course as certain experts will tell you, this is best for everybody. Thanks to the insurance industry's carefully positioned propaganda of the last 30 years, you've come to believe you can't possibly sell your services to the public without health insurance to support you. And you've come to believe you can only sell slightly any more than Insurance is willing to pay for. You've come to believe what you were intended to believe. The insurance industry has it set up so that you, your patients, the media, the government, virtually everybody, believes "you can't have health *care* without health *insurance*".

Taking it a step further, you may have read recently where Managed Care has been defended as something necessary "to protect the rights of patients". You may have read where Managed Care has been defended as something necessary "to make sure Dentists are accountable to *someone*". And I couldn't help getting an eerie feeling when I read this. Because even though I know better, the libelous intent of any such remarks kind of sticks to you even when you do know better. *"Protect patient's rights? Well, yes, I'm for that!"* I thought to myself. *"Make sure Dentists are accountable? Well, yes you'd want anyone to be accountable."*

And then I caught myself. I had been just for the moment, dragged into that shadow kind of reasoning which always seems to accompany a very bad idea dressed up in very nice clothes. The media among others is great for this. By inference and suggestion you suddenly find yourself (*and when it's done really well, you don't notice it's happening; and the people who perpetrate such don't want you to notice*), doubting the trustworthiness of the target of the innuendo. In this case, it's Dentists, it's you, reading this essay, who are supposed to start doubting each other and start wondering what kind of skulduggery must be going on behind other Dentists' closed operatory doors that would "require" Managed Care to march in and "fix it all up". But, wait a minute! Patient's rights is not an ignored subject. Various sources cover these bases intensively, regularly and consistently. Some argue they go too far. But there is no lack of "protection". And hold on again, Dentists ARE accountable, to state review boards, state government regulatory agencies, malpractice laws, etc., etc., etc. There's no super shortage of accountability at all! Someone just wants you to think there is - not consciously, but in the back of your mind, where it can fester but never be spotted for what it is - an effort to disaffect you from your own profession.

What's at stake is your willingness to go on being what you are. What's at stake is your own camaraderie, one to another, your own trust in and pride in being a Fee For Service Dentist. If anyone can break that pride, can divide your ranks and make you think you need to belong to "big corporate America" in order to justify your existence, the occupation known as "Individual Fee For Service Dentist" will cease to exist. I founded Galileo™ Treatment Acceptance Training™ because I had in my possession something called The Technology of Selling™. A No-Insult, No-Pressure, No-Mind-Game approach to Treatment Acceptance. We call it The Galileo™ Perfect Approach™ because it teaches you step by step, just like the pilot of a 747, how to make a soft landing (or, in our field a no-pressure sale of Full Care Dentistry™). Along the way, I found out what Managed Care intends for the Individual Dentist and from that day to this one, I've dedicated Galileo™ to giving you a fighting chance to survive both the insurance industry in general and Managed Care in particular. We think of you being somewhat like the "captain of the Titanic". While other programs seem to suggest redecorating the Grand Ballroom, changing the stewards' uniforms or holding an encounter session for the crew as a whole, we put all our attention on getting you to **steer hard starboard before it's too late**. Call 1-800-GALILEO to hear more. We like talking about this!

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The World Of Pre-Paid Dentistry

David Somer, DDS

In previous columns, I've talked in fairly broad terms about third party dental plans, and how they have helped front-line dentists to provide Canadians with the best oral health in the world. Third party plans have not only given Canadians easy access to high-quality, affordable dental care, they have also led to an increased utilization of preventative dental services, and contributed to the gains that we've seen in the oral health status of our patients over the last 25 years.

I've also outlined the steps that CDA is taking, in cooperation with our corporate members, the 10 provincial dental associations, to protect Canada's unique oral health care delivery system.

Our new steering committee on dental benefits issues will meet again in the next few months to finalize its strategic plan and take the next all important steps toward its stated goal: "To assist dentistry to maintain control of dental care, in the interests of patients and dentists, by developing initiatives to communicate effectively with target publics, and to foster development of funding arrangements supportive of optimal oral health care."

What I'd like to do this month is to review the types of dental plans that are already in the marketplace, particularly in the United States. You may already be familiar with some of the managed care terminology — the managed care issue has been hotly debated south of the border for more than a year, and managed care has made significant inroads into the U.S. dental market. Managed care is still a relatively new phenomenon in Canada, however, and you may not be aware of all the different types of plans out there, or of how they are defined.

The intent of this month's column is to provide dentists with a readily accessible and complete list of managed care definitions. As you read through it, please remember that some of these definitions can be used in combination with others on the list, and that there are few, if any, dental practices that operate solely under one type of plan — as a preferred provider organization (PPO), for example. Most of the practices that subscribe to managed care plans have a large fee-for-service component as well.

Capitation: A capitation dental benefit program is one in which a dentist or dentists contract with the program's sponsor or administrator to provide all or most of the dental services covered under the program to subscribers in return for payment on a per-capita basis.

Contract Fee Schedule Plan: A dental benefits plan in which participating dentists agree to accept a list of specific fees as the total fees for dental treatment provided.

Direct Reimbursement: A self-funded program in which the individual is reimbursed based on a percentage of dollars spent for dental care provided, and which allows beneficiaries to seek treatment from the dentist of their choice.

Exclusive Provider Organization (EPO): A dental benefits plan that provides benefits only if care is rendered by institutional and professional providers with whom the plan contracts (with some exceptions for emergency and out-of-area services).

Health Maintenance Organization (HMO): A legal entity that accepts responsibility and financial risk for providing specified services to a defined population during a defined period of time at a fixed price. An organized system of health care delivery that provides comprehensive care to enrollees through designated providers. Enrollees are generally assessed a monthly payment for health care services and may be required to remain in the program for a specified amount of time.

Individual Practice Association (IPA): A legal entity organized and operated on behalf of individual participating dentists for the primary purpose of collectively entering into contracts to provide dental services to enroled populations. Dentists may practice in their own

offices and may provide care to patients not covered by the contract as well as IPA patients.

Preferred Provider Organization (PPO): A formal agreement between a purchaser of a dental benefits program and a defined group of dentists for the delivery of dental services to a specific patient population, as an adjunct to a traditional plan, using discounted fees for cost savings.

Closed Panel: A closed panel dental benefits plan exists when patients eligible to receive benefits can receive them only if services are provided by dentists who have signed an agreement with the benefits plan to provide treatment to eligible patients.

As a result of the dentist reimbursement methods characteristic of a closed panel plan, only a small percentage of practising dentists in a given geographical area are typically contracted by the plan to provide dental services.

Contract Dentist: A practitioner who contractually agrees to provide services under special terms, conditions and financial reimbursement arrangements.

Contract Practice: A dental practice in which an employer or third-party administrator contracts directly with a dentist or group of dentists to provide dental services for beneficiaries of a plan. (See Closed Panel.)

Gate Keeper System: A managed care concept used by some alternative benefit plans, in which enrollees elect a primary care dentist, usually a general practitioner or pediatric dentist, who is responsible for providing non-specialty care and managing referrals, as appropriate, for specialty and ancillary services.

Nonparticipating Dentist: Any dentist who does not have a contractual agreement with a dental benefits organization to render dental care to members of a dental benefits program.

Open Panel: A dental benefit plan characterized by three features:

1) Any licensed dentist may elect to participate.
2) The beneficiary may receive dental treatment from among all licensed dentists, with the corresponding benefits being payable to either the beneficiary or the dentist.
3) The dentist may accept or refuse any beneficiary.

Participating Dentist: Any dentist who has a contractual agreement with a dental benefit organization to render care to eligible persons.

In subsequent months, I will describe a number of these managed care arrangements in more detail, and explain how they could impact on you, the practising dentist. I'll also talk more about what CDA is doing to protect your interests, as a provider of dental services, and those of your patients, who are seeking optimal oral health care.

If you have any comments or suggestions on this column, or the managed care issue, we'd like to hear from you. Please write to me at CDA, 1815 Alta Vista Drive, Ottawa ON K1G 3Y6. ■

Dr. David Somer maintains a private dental practice in Hamilton, Ontario. He is a member of CDA's executive council and the chairman of the CDA steering committee on dental benefits issues.

Acknowledgements: The preceding definitions are taken from the first edition of the CDT-1 Current Dental Terminology, 1990-1995.

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NEWS UPDATE

Health and Dental Benefits Remain Tax Free

Dentists across Canada have come out three times lucky in their fight to maintain the tax-free status of employer-sponsored dental and health plan premiums.

Finance Minister Paul Martin, despite speaking for more than 85 minutes, did not make even a passing reference to health and dental plans March 6 when he presented his 1996-97 budget.

By remaining silent on health and dental plans, Mr. Martin effectively preserved the status quo for at least one more year. Employer-sponsored health and dental plan premiums will remain tax free, removing one of the major threats to Canada's unique oral health care delivery system.

This is good news for both dentists and ordinary Canadians. Research conducted last year by Mercer Ltd. on behalf of CDA and its partners in the Action Plan Committee for Fair and Supportable Tax Treatment For Health and Dental Programs indicates that 25.6 million Canadians, or 87.7 per cent of the population, are covered by some form of government or private supplementary health and dental plan.

"There is no question that the work we did with the Action Plan Committee and Mercer had an impact on the outcome of this no-tax campaign," said CDA president Dr. James Brookfield. "Mercer's research gave us the hard data we needed to put the tax-equity issue in perspective, and to make an informed, comprehensive presentation to the House of Commons Standing Committee On Finance. It made a difference. So did our MP contact program, and so did all the dentists and patients who signed CDA's petition against the taxation of dental plan premiums. The other big factor was unity. Just as they did in 1994, CDA's corporate members threw their support behind our initiatives, rolled up their sleeves, and went to work on behalf of dentists and their patients. The provincial associations, and their members, deserve our praise and gratitude."

While CDA is pleased with the outcome of the 1995-96 no-tax campaign, the association would have preferred to see Mr. Martin impose a moratorium on future changes to the tax status of health and dental benefits until such time as the government has conducted a comprehensive review of the tax system, and how it impacts on all aspects of Canada's health care delivery system.

"By remaining silent on the issue of health and dental benefit plans, the finance minister has left all his options open. The issue is still on the table, and Canada's oral health

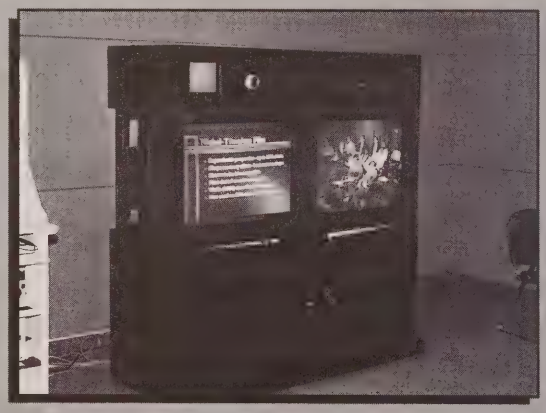
CADR Holds Televideoconference

Research conferencing took a new twist January 27, when the midwest section of the Canadian Association for Dental Research (CADR) held the first televideoconference meeting between the University of Alberta in Edmonton and the University of Saskatchewan in Saskatoon.

The midwest section of CADR is composed of the dental faculties of the universities of Alberta, Saskatchewan and Manitoba. During the past 12 years, the organization's meetings have been held in a traditional venue in Edmonton, Saskatoon and Winnipeg. However, the exigencies of budget cuts and Prairie winter weather, both of which preclude travel for a research meeting, led to the institution of televideoconferencing for the 1996 meeting.

Although the University of Manitoba did not participate, televideoconferencing made it possible to present 12 research papers between the college of dentistry, University of Saskatchewan, and the oral health sciences department, University of Alberta, without any of the participants having to travel very far through the minus 30 degree temperatures raging outside.

Plans are already in place to repeat this successful method of research conferencing in future years. ■



CADR televideoconference monitor used to link researchers at the universities of Saskatchewan and Alberta.

Dr. G.H. Sperber (right) chairs the first CADR televideoconference under the watchful eye of Mr. L. McMurdo, audiovisual technician.

care delivery system is still threatened," said Dr. Brookfield. "Until this threat is removed, and Mr. Martin has made his intentions absolutely clear, CDA and our provincial partners will have to continue our campaign against the taxation of employer-sponsored health and dental plan premiums."

Full details on the 1996-97 budget will be provided in the March-April issue of *Communiqué*. ■

RRSP Limits Frozen

Finance Minister Paul Martin has imposed a seven-year freeze on the annual tax-deductible contribution limits for registered retirement savings plans (RRSPs).

In his 1996-97 budget speech, Mr. Martin announced that annual RRSP contribution limits will be frozen at $13,500 from 1996 through 2003. Limits will be allowed to increase by 1,000 per year in 2004 and 2005, however, to reach a maximum of $15,500. Once this maximum has been achieved, future increases in contribution limits will be tied to wage inflation.

Although the cuts were bad news for dentists and other self-employed Canadians, they were much less severe than some analysts had predicted.

"We had hoped that Mr. Martin would stick by the promises he made in the 1995 budget," said CDA president Dr. James Brookfield. "Last year, Mr. Martin reduced the planned RRSP contribution limit for 1996 from $15,500 to $13,500, with the promise that it would increase to $14,500 in 1998 and $15,500 in 1999. This year he's taken a further step backwards from that target, and that's bad news for all self-employed Canadians. When Canadians are being told that the Canada Pension Plan is in jeopardy, and old age security payments are being chopped, surely it is not the time to restrict the ability of Canadians to make tax-free contributions to private retirement savings and pension plans."

Mr. Martin has also frozen the contribution limits for money purchase plans, a type of registered pension plan for employed Canadi-

CSA Introduces "Frank" — The World's First Adult Test Headform

The Canadian Standards Association (CSA) recently added "Frank" — an adult test headform with accurate facial features — to its "all star" test team.

Headforms are models of the human face and head that are used to test many types of sports protective equipment, such as hockey mouthguards and helmets.

Frank joins the juvenile/female headforms that have been developed since 1983, when CSA introduced its first model, "Allan Average."

CSA's headforms have been developed mainly through the pioneering work of volunteers, including several prominent Canadian dentists.

Allan Average, the headform of an eight-year-old boy, is used to test face protectors for five to 10 year olds. A juvenile headform, suitable for testing equipment for children aged 11 to 13 and adult women was produced in 1988. With the addition of Frank to its headform line up, CSA now has a model that can be used around the world to test not only hockey face protectors and goalie masks, but also racquet sports and industrial eye wear, as well as military gas masks.

"Because of its accurate facial features, the headform can be used in testing any protective device that may affect visual function," explains Dr. Tom Pashby, an ophthalmologist and volunteer member of the CSA task force. "When CSA tests hockey face masks, the distance between the headform eyes and the protector is truly representative of real life conditions. This means we can determine whether the face mask will protect a hockey player without interfering with peripheral vision."

Frank is named in honor of the late Dr. Frank Popovich. An orthodontist, he collected growth and developmental data from 1,380 children and 312 parents during his long-time association with the Burlington Growth Centre, which stretched between 1952 and 1971. Data from the Burlington Study was integral to the pioneering work of Mississauga pediatric dentist, Dr. Arthur Wood, who has spent more than 45 years promoting and developing sports protective devices. Another well known Canadian dentist, Dr. William McIntosh, a former executive director and past-president of the Canadian Dental Association, contributed his artistic skills by taking the Burlington Study data and sculpting the headforms to specification. ■

CSA's Allan Average, Frank and the juvenile/female headform.

Top Of the World Dentistry

A recent continuing education program held in Yellowknife, Northwest Territories — under the course title Aurora Borealis Cosmetic Dentistry — is likely the most northerly dental presentation in recent years. But the minus 35 degree outdoor temperature was more than balanced by a warm and representative attendance from the entire Northwest Territories Dental Association. ■

Meeting in Yellowknife (l. to r.): Mr. Ken Dickson, Aurum Ceramic (sponsor); Drs. Charles Pastori, Igaluit, president NWT Association; John Nasedkin, Vancouver (speaker); Dean Gould, Inuvik, secretary; and James Tennant, Hay River, past-president.

ans, at $13,500. The freeze will be in effect until 2002. At that point, limits will increase by $1,000 per year until they reach a maximum level of $15,500 in 2004. Limits were previously set to increase to $14,500 in 1997 and $15,500 in 1998, with future increases to be indexed to inflation.

Another change to Canada's pension system requires Canadians to close their RRSPs at age 69 rather than age 71. However, Canadians will be allowed to carry the unused portion of their allowable annual contributions forward up to the age of 69, instead of to the previous seven-year limit.

Full details of the changes to Canada's RRSP regulations will be provided in the March-April issue of *Communiqué*. ■

Ottawa Dentist Cleared In HIV Discrimination Case

An Ottawa dentist who was accused of discrimination because she donned a sterile paper gown to treat an HIV-positive patient has finally been absolved of any wrong doing by the Ontario Human Rights Commission (HRC).

In a February 16 ruling, the HRC turned down the patient's request for a reconsideration of its earlier decision not to refer the case to a formal board of inquiry.

That decision, rendered September 7, 1995, stated that the extra infection control precautions taken by the dentist during a 2½-hour appointment to provide restorative treatment to a known HIV-positive patient were "justified on health grounds."

The patient's appeal, which was made within two weeks of the HRC's September decision, was ultimately rejected on the grounds that he failed "to raise sufficient material facts to permit a reversal of the commission's original decision."

The HRC's February ruling effectively brought the Ottawa HIV discrimination case to a close, ending nearly two years of anxiety, legal bills and frustration for the dentist involved. The patient has no further avenue to appeal the HRC's decision, or to pursue the case through the judicial system.

In fact, the 2½-hour appointment that led to the case occurred November 18, 1993. Prior to initiating treatment, the dentist informed the patient that she would be wearing a sterile paper gown, in addition to her normal infection control attire, because she was concerned that he was immunocompromised.

Although the patient accepted the proposed treatment plan, and booked a recall appointment with the dentist, he subsequently lodged a complaint against her with the Royal College of Dental Surgeons of Ontario (RCDS) and the HRC.

The basis of the patient's complaint was that the dentist had taken extra barrier precautions during his appointment, which meant that anyone walking by the operatory at the time of his appointment would have known that he had an infectious disease. According to the patient, this caused him to experience severe mental anguish.

Despite this, the dentist was not informed of the patient's concerns until February 23, 1994, when she was contacted on his behalf by a case worker from the University of Ottawa's community legal clinic.

On June 29, 1994, the dentist was sent a letter from the RCDS informing her that a complaint had been filed against her by the patient. She received a similar letter from the HRC on August 15, 1994.

The patient's complaint to both the RCDS and the HRC states that the dentist wore clothes that he found offensive, including a pair of non-prescription glasses, a pair of rubber gloves, a paper towel like gown including paper leggings and little boots, a surgical mask and an apparatus that looked like a welders' mask. It also stated that the dentist seemed to be upset about having to wear so much clothing, and that she made a number of comments to the patient indicating that she would not have had to wear "so much stuff" if the patient had not been HIV positive.

In an interview with *Communiqué* (see Ottawa Dentist Faces Charges of Discrimination. *Communiqué* July-August: 7, 15, 1995; and No Settlement Yet in Ottawa HIV Discrimination Case. *Communiqué* Sept.-Oct.:7, 1995), the dentist said that the only extra barrier protection that she wore during the patient's November 18, 1993, ap-

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University Of Western Ontario Opens Simulation Clinic

With the introduction of computerized simulation clinics to the University of Western Ontario's faculty of dentistry, dental teaching in Canada has gone high-tech.

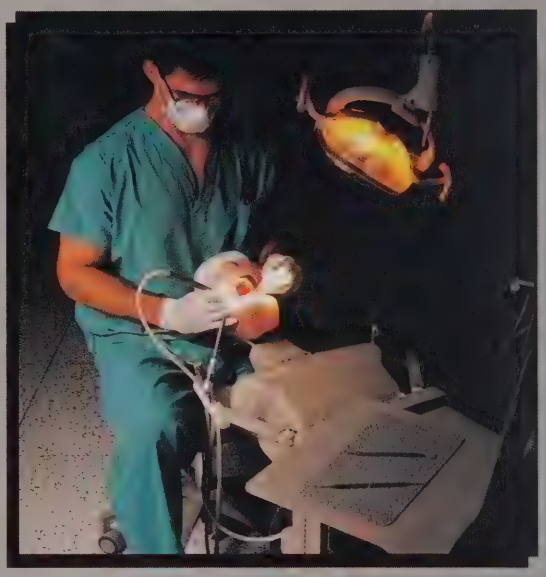
As a result of the change, the days of preclinical students "treating teeth on a stick" have disappeared. So, too, have the days when dentoform "patients" without cheeks, lips or tongue were clamped (most of the time) to a laboratory bench with inadequate lighting and a lack of operatory-type instrumentation.

In their place, one of the preclinical laboratories at UWO has been changed into a simulation clinic featuring 50 radically different treatment units. The units were cooperatively developed between A-dec of Newberg, Oregon, and university faculty members. Each individual station consists of a simulated patient and an array of state-of-the-art operatory equipment. The "patient" has anatomically correct shoulders, with infinite up, down, and tilt mobility. Similarly, the anatomically-correct head, engineered by Frasaco of Tettnang, Germany, features total adjustability and surprisingly life-like cheeks, tongue and teeth. The equipment includes a high-efficiency operatory light, high-volume suction and three-way syringe. Handpiece options include high and low speed, wet and dry cutting, and fibre optic illumination.

First-year students are introduced to their "patient" from day one. Ergonomically-sound treatment delivery patterns are taught and developed at the same time as students learn to maximize lighting and vision, discover proper finger and instrument positioning, and experience wet-tooth cutting.

The new clinic is totally dedicated to patient treatment simulation. Unlike the old style of clinic, it will be used as a dental operatory one day and then double as a traditional technique laboratory the next afternoon. Accordingly, the dental faculty has restructured its preclinical curriculum so that only intraoral and directly-related procedures are performed in the simulation clinic environment. Students are required to wear gloves and clinic attire, and infection control principles are taught from day one. Technical bench-top activity is not neglected, but it is now offered in an adjacent traditional laboratory, as required.

Many positive dividends are anticipated as students, practitioners and faculty use the new simulation clinic. In particular, it should help students to make a smoother transition from preclinical to clinical work. Students are expected to experience significantly less stress, as well as to develop ergonomically sound work patterns for their professional lifetime. The simulation clinic is part of a $3.25-million priority fund-raising project to renovate and refit the faculty's dental clinic, which has treated more than 650,000 patients in the past 26 years. The faculty of 150 full and part-time instructors admits 48 students a year. ■



The University of Western Ontario has developed a new state-of-the-art preclinical simulation unit.

pointment was a sterile paper gown.

Ultimately, however, a panel of the RCDS's complaints committee found that the dentist had acted inappropriately when she used extraordinary barrier precautions during the patient's appointment. This decision was based on the premise that infection control "precautions must be universal unless there is a bona fide reason for departing from that principle...," and that a dentist "must wear the same 'stuff' for HIV-positive and HIV-negative patients."

In March 1995, the RCDS informed the dentist that she would have to appear before a panel of its complaints committee to be cautioned. She ultimately appeared before the panel, and received an oral caution, on January 26, less than a month before the HRC cleared her of any wrongdoing in the case. ■

Workshops On Family Violence Presented

Although family violence is being recognized by an increasing number of health care professionals as a serious social concern and major health problem, there is clearly a need for more information on the issue.

Health Canada may have some answers. The department recently sponsored a series of workshops in Vancouver, Edmonton and Toronto to provide interested dental health professionals with essential knowledge and skills in family violence issues.

Selected organizations and institutions were invited to send representatives with a specific interest in the topic. If the concept works as planned, these individuals will ultimately become resource personnel and advocates for victims of family

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*CRA Newsletter, Vol. 18, Issue 5, May 1994.

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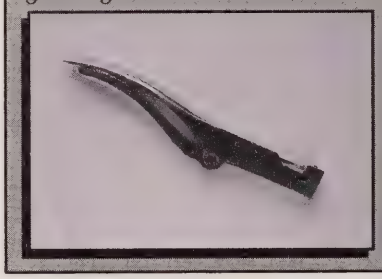
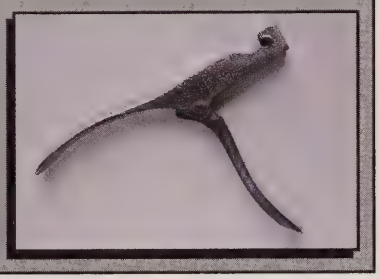
WHAT'S IT?

Thought to be more than 50 years old, this month's "What's It" item is 17 centimetres in length and made of heavy steel. Stamped on one side with the name "Williams," the mechanism appears to be a bending device, but it seems to be much too heavy for normal orthodontic purposes. Can you assist in identifying the instrument so we can find a proper place for it within the CDA museum? If so, please write to Dr. P. Ralph Crawford, Canadian Dental Association, 1815 Alta Vista Drive, Ottawa ON K1G 3Y6.

Special thanks to all those who wrote identifying the Indian Head X-Ray Reflector, and particular thanks to Dr. Marc Trépanier of Farnham, Quebec, who sent us not only a letter on how his father, Dr. Olivier Trepanier, used the mirror in the 1950s, but also included a commercial clipping of Union Broach's advertisement on how "for the first time, it gives dentists the opportunity of accurately checking their work as they go along." ■





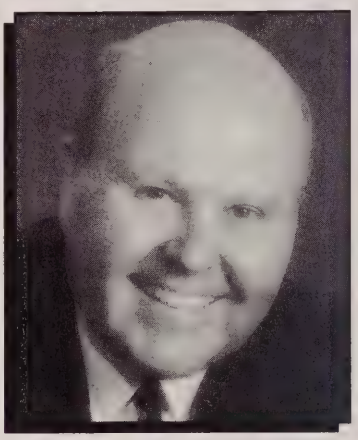
Donna Denham (left) and Joan Gillespie, consultants to Health Canada, conduct a workshop on family violence for the dental community.

violence within their local community, educational, social and political arenas.

Workshop participants included dental assistants, dental hygienists, denture therapists, dental therapists, dental educators, dental practitioners associated with provincial organizations, and practitioners in private practice, as well as staff and council from regulatory bodies.

The workshops were conducted by Donna Denham and Joan Gillespie, the consultants who recently prepared Health Canada's *Family Violence Handbook for the Dental Community*. The two consultants have presented their workshop findings to the Mental Health Directorate of Health Canada, as well as participating in a national briefing March 13 in Ottawa. CDA was represented at the briefing, along with participants from the Canadian Dental Assistants' Association, the Canadian Dental Therapists' Association, the Canadian Dental Hygienists' Association and the Commission On Dental Accreditation In Canada. ■

Dr. Barry Chapnick Elected A/O International Editor



Dr. Barry Chapnick

Dr. Barry Chapnick, a Toronto endodontist, has been elected international editor of the Alpha Omega International Dental Fraternity.

A 1970 graduate of the University of Toronto's faculty of dentistry, Dr. Chapnick received his graduate endodontic training at the Henry Goldman School of Graduate Studies at Boston University.

Alpha Omega International Dental Fraternity was founded in 1907 to provide mutual support for Jewish dental students faced with discrimination in the academic community. Over the years, the association expanded in both membership and mission, and now represents more than 15,000 Jewish dentists and dental students. Today the fraternity is organized into over 125 alumni and student chapters throughout North America, Europe, Israel, South Africa, Australia and South America.

Alpha Omega's philanthropic arm, the Alpha Omega Foundation, has granted over $12 million dollars in aid to dental schools, clinics, local, national and international projects relating to dental health, scholarships, research grants and humanitarian causes. ■

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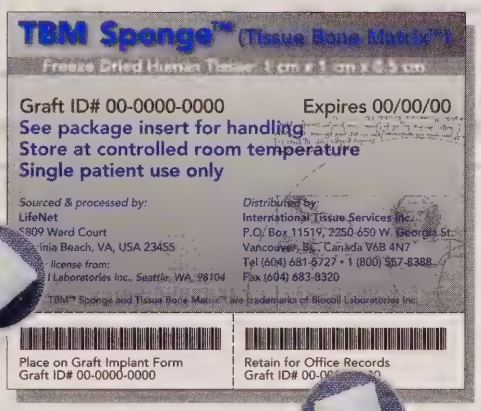

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1. Urist, M.: Bone formation by autoinduction. Science. 150:893; 1965. Sampath, T.K., Nathanson, M.A. and Reddi, A.H.: In vitro transformation of mesenchymal cells derived from embryonic muscle into cartilage in response to extracellular matrix components of bone. Proc. Nat. Acad. Sci. 81:3419-3423; 1984.

*Refund excludes shipping, handling and insurance.

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Canada Participates In ISO Meeting

Canada was one of 19 countries represented when the International Standards Organization Committee ISO/TC 106 Dentistry conducted its 31st meeting October 30 to November 3 last year.

The international meeting is held annually in various countries around the world. Last year's event was held in the international conference hall in Kyoto, Japan, marking only the second time it has been held in Japan.

Most of the 240 expert delegates at the meeting were volunteers who were nominated by the 19 represented countries to attend. Delegates work in committees to draft and develop standards for dental materials, devices and equipment. A total of 38 working groups and subcommittees as well as the full technical committee met at least once during the six-day meeting.

The ISO dental technical committee has developed over 90 dental standards to date and is currently working on 65 new standards or revisions of existing standards. One committee, for example, is working to develop biocompatibility test methods for materials and devices.

CDA has long recognized the importance of standards for dental materials and devices. The close working relationship of the CDA committee on dental materials and devices and the Canadian advisory committee ISO/TC 106, chaired by Dr. Derek Jones of Dalhousie University, has been well established for many years.

In addition to the funding provided by Standards Council of Canada, the Canadian advisory committee ISO/TC 106 receives generous financial support from the dental industry. This year's sponsors included Ash Temple and Beaver Dental companies. ■

LIBRARY PACKAGE

This month's library package — or Search of the Month — is **GLASS IONOMER CEMENTS.** This package is available to CDA members for $5, plus applicable taxes.

The CDA Library/Resource Centre, can be reached by telephone at: 1 (800) 267-6354 ext. 223; or by fax at: (613) 523-6574. We can even be accessed over the INTERNET at: cdalib@magi.com.

The CDA Library/Resource Centre offers a wide selection of books and videos to CDA members for a two-week loan period at a shipping/rental fee of $5, plus applicable taxes.

ABSTRACT — PREVENTIVE DENTISTRY

The Effect of Chlorhexidine Irrigation on Plaque Vitality

Chlorhexidine gluconate is effective against a broad spectrum of microbes and has gained widespread use in dentistry. This agent is effective in the control of gram negative and gram positive bacteria and has been shown to be a good anti-plaque chemical. In this study chlorhexidine as used in a pulsed oral irrigator was compared to saline to establish the effectiveness of this agent in areas that are difficult to access.

This study used 24 participants with a mean age of 43 years and a diagnosis of adult periodontitis. An initial examination established the baseline plaque index, gingival index, bleeding on probing and plaque vitality. Four matched teeth in each quadrant with a plaque index score of two or three were chosen in each participant. Each participant was randomly assigned to one of four treatment groups. Participants in Group 1 rinsed for 60 seconds with 0.2 per cent chlorhexidine, Group 2 irrigated for 15 seconds with 0.2 per cent chlorhexidine using a pulsed oral irrigator, Group 3 rinsed for 60 seconds with saline and Group 4 irrigated for 15 seconds with saline.

Plaque samples were then taken for each participant 30 minutes after the rinse or irrigant was used. The vitality of the plaque samples was then assessed using fluorescent analysis. There was no difference in the baseline scores for plaque index, gingival index, bleeding on probing and plaque vitality in any of the participants. The plaque vitality of the participants at baseline was 50 to 75 per cent which was reduced in the two chlorhexidine groups to 40 per cent. There was no change in plaque vitality seen in either of the saline groups. Statistical analysis showed that plaque vitality was reduced significantly more by chlorhexidine irrigation as opposed to rinsing with chlorhexidine.

Periodontal disease can be difficult to control in areas where access is difficult. Plaque deposits that are difficult to reach may benefit from the use of chlorhexidine in a pulsed oral irrigation device. This is thought to be due to the effective delivery of chlorhexidine to the plaque surface and subsurface areas.

The authors conclude that chlorhexidine is more effective in the reduction of plaque vitality when delivered by a pulsed oral irrigator than when used as a rinse.

Walsh, T.F. et al. J Clin Perio 22:262-264, 1995. Reprinted with permission from The Dentaletter, February, 1996.

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The SLSA Program is published as a monthly feature in the *Journal of the Canadian Dental Association* as a resource for dentists wishing to enhance their dental knowledge and expertise. It is intended as a vehicle for self-learning and self-assessment. The program is based on a series of 40 questions, answers, rationales, and references, followed by an annual 15-question quiz. The 1995-96 quiz will appear in the June 1996 issue of the *Journal.* Answers to the quiz will be published in the August 1996 issue. Dentists who complete the quiz may be eligible to receive continuing education points, and their names will be forwarded to their provincial licensing bodies for consideration.

Questions 31 through 35 are a repeat of the questions that appeared in the March issue of the *Journal* accompanied with correct answers, the rationales and specific references. Question 36 through 40 are new questions — watch for their answers and rationales next month. Keep all copies of the *Journal* so you can correctly respond to the June 1996 quiz.

QUESTION 31

Organisms trapped in fissures by sealants
A. interfere with the sealant adhesion.
B. cause pulpitis.
C. proliferate.
D. cause further enamel decalcification.
E. None of the above.

ANSWER: E

RATIONALE:
Since the sealant has been acid etched to the tooth surface, the peripheral resin has an adequate seal which prevents percolation. Organisms, therefore, decrease in viability and caries progression is prevented. Because the lesion in the fissure base is small and the area of acid etched enamel is extensive by comparison, the retention of the sealant is not affected.

REFERENCES:

(1) Waggoner, W.F. Managing occlusal surfaces of young permanent molars. *JADA* 122:72, 1991.
(2) Swift, E. The effect of sealants on dental caries: A review. *JADA* 116:700, 1988.

QUESTION 32

Compared to surgical lengthening of a tooth crown, forced eruption
(1) causes esthetic problems.
(2) reduces plaque control problems.
(3) requires the same precautions to avoid pulp exposure.
(4) is preferred in the anterior maxilla.

A. (1) and (2)
B. (1) (2) (3)
C. (3) and (4)
D. All of the above.

ANSWER: C

RATIONALE:
Surgically lengthened clinical crowns can lead to pulpal complications during crown reduction with occasional need even to extirpate vital pulps. The surgical treatment invariably extends into the concave surfaces of the roots which causes difficulty in plaque control and this may lead to root caries. Additional considerations are the placement of the margin and the shaping of the root portion of the crown for esthetics. Patient cooperation with rigorous plaque control using suitable interproximal

cleansing aids is essential for a reasonable prognosis. Since periodontal support is reduced, this must also be taken into consideration. Although surgical lengthening of clinical crowns gives immediate results, forced eruption of a tooth, especially in the anterior region where esthetics is important, can provide the clinician an alternative method. It does, however, take time to move the tooth into an appropriate position. The same precautions regarding pulp exposure and concave surfaces on roots giving plaque control problems still require consideration.

REFERENCES:

(1) Marzouk, M.A., Simonton, A.L. and Gross, R.D. *Operative dentistry — Modern theory and practice.* St. Louis: Ishiyaku Euro, 1985, Chapter 28.

(2) Shillinburg, H.T., Hobo, S. and Whitsett, L.D. *Fundamentals of fixed prosthodontics.* 2nd ed. Chicago: Quintessence Publishing Co., Inc., 1981, Chapters 1 and 7.

(3) Ivey, D.W., Calhone, R.L. and Kemp, W.B. Orthodontic extrusion: its use in restorative dentistry. *J Prosth Dent* 43:401-407, 1980.

QUESTION 33

When the gingival margin of a Class II cavity preparation extends beyond the cemento enamel junction, you could restore the tooth with

(1) amalgam.
(2) cast gold.
(3) composite resin only.
(4) composite resin and glass ionomer cement.

A. (1) only
B. (1) (2) (4)
C. (3) only
D. (1) (2) (3)
E. All of the above.

ANSWER: B

RATIONALE:

If the gingival wall is related to the cemento-enamel junction, composite resin alone is contraindicated because of the difficulty of securing a positive seal. In such cases, glass ionomer cement should be bonded to the margin and the remainder of the restoration built up in composite resin. Otherwise amalgam or cast gold restorations should be used.

According to Jordan and Suzuki (1991), composite resin restorations are indicated in the posterior region where:

- esthetics is of primary importance.
- the bucco-lingual width of the cavity preparation is less than one-third of the intercuspal width of the tooth.
- butt-end joints between the tooth and the composite resin can be provided.
- where the gingival cavosurface margin is located in intact enamel.
- where centric stops on the occlusal surface are located on sound enamel.

REFERENCES:

(1) Jordan, R.E. and Suzuki, M. Posterior composite restorations where and how they work best. *JADA* 122:31, 1991.

QUESTION 34

In children recession of the gingivae on the labial aspects of mandibular incisors is self-correcting.

Eight per cent of children show labial recession on mandibular incisor teeth.

A. The first statement is true, the second false.
B. The second statement is true, the first false.
C. Both statements are true.
D. Both statements are false.

ANSWER: C

RATIONALE:

The literature reports that approximately eight per cent of children show labial recession on mandibular incisor teeth. It has become common practice to subject these teeth to surgical procedures of either a lateral sliding flap or a free gingival graft. Where orthodontics is contemplated, the surgical repair usually precedes the orthodontic therapy.

A recent study of children aged six to 13 years allowed observation and measurement from the gingival margin of the recessed areas to the cemento enamel junction. Observation over one, two and three years saw a gradual reversal of the recession. No site was worse and the majority improved.

REFERENCES:

(1) Andlin-Sobocki, A. et al. Gingival recession in children. *J Clin Periodontol* 18:155-159, 1991.

QUESTION 35

Prevention of alveolar bone loss in a patient with active osteoporosis requires

A. rigorous plaque control.
B. estrogen replacement therapy.
C. calcium supplements.
D. All of the above.

ANSWER: D

RATIONALE:

Osteoporosis is characterized by low bone mass and deterioration of the bone architecture leading to increased bone fragility and fracture. It is referred to as the "silent disease" — symptomless early and occurring most frequently but not exclusively in post-menopausal women. Recent work using improved diagnostic methods has shown that oral bone loss accompanies osteoporosis to cause ridge resorption as well as alveolar bone height reduction with subsequent tooth loss.

Efforts to prevent oral bone loss are directed at plaque control and, where suspected, referral of patients for appropriate systemic management with estrogen replacement therapy and calcium supplementation. A patient who is edentulous requires careful and frequent scrutiny by the dentist to check that dentures fit and occlusion is satisfactory to prevent accelerated ridge resorption.

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(2) *The Oral Care Report* Vol. 4. Ed. G. Nikiforuk. September, 1994.

The SLSA program is a resource and service, directed to the dental profession and the licensing authorities, which is intended to help dentists achieve and maintain the high levels of expertise and competence identified by Canadian dental licensing authorities. All questions and other material are based on current, referenced literature.

Financial support for the program has been provided by A-dec, Colgate, the Fowler-Pearce Partnership (Nesbitt Burns), Nobelpharma, and Sci-Can.

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The views expressed in the questions, answers and rationales of the SLSA program are not necessarily those of the Canadian Dental Association or its related organizations.

THIS MONTH'S FIVE NEW QUESTIONS

QUESTION 36

When making a bonded amalgam restoration in a deep cavity close to the pulp, you would

(1) always place a lining.
(2) apply dentin conditioner.
(3) use a wetting agent or a primer.
(4) apply a bonding agent.

A. (1) (2) (4)
B. (2) (3) (4)
C. (3) and (4)
D. All of the above.

CDA encourages Canadian dental licensing authorities to recognize the SLSA Program as an appropriate and acceptable resource for dentists seeking to earn the continuing education credits required for the maintenance of licensure.

Currently, all 10 provincial licensing bodies — British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland — recognize the SLSA program for continuing education credits.

QUESTION 37

When treating a patient with a cardiac problem, you would avoid use of a local anesthetic containing epinephrine solution because

A. the heart rate will be increased.
B. the venous pressure will decrease.
C. the arterial pressure will increase.
D. None of the above.

QUESTION 38

In a 21-year old patient, using a panoramic radiograph, you can predict that an impacted mandibular third molar with complete root formation will more readily erupt when

(1) there is sufficient space between the ramus and the second molar.
(2) the tooth is vertical.
(3) the impaction is completely in bone.
(4) the tooth is at the same occlusal level as the second molar.

A. (1) and (3)
B. (1) (2) (4)
C. (2) only
D. All of the above.

QUESTION 39

Peri-implant soft tissue inflammation can be controlled by

(1) chlorhexidine rinses.
(2) topical fluoride applications.
(3) regular maintenance hygiene visits.
(4) removal of plaques.

A. (2) (3) (4)
B. (1) (3) (4)
C. (2) and (3)
D. All of the above.

QUESTION 40

Amoxicillin is

(1) more active against gram-negative cocci than Penicillin V.
(2) more active against gram-positive cocci than Penicillin V.
(3) more active against gram-negative bacilli than Penicillin V.
(4) the drug of choice in prophylaxis against endocarditis.
(5) more liable to produce gastro-intestinal upset than Ampicillin.

A. (1) and (5)
B. (2) and (5)
C. (1) (3) (4)
D. (2) (3) (5)

(Answers to questions 36-40 will appear in next month's *Journal.*)

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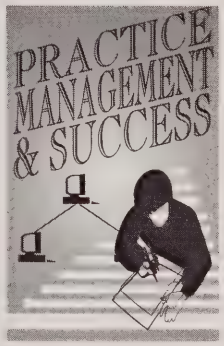

Heads Up On Hygiene

Imtiaz Manji, B.Sc.

In January, when I began this series of articles about preparing for the future of dentistry, I wrote about the impending demise of the six-month recare visit. This trend, far from being years in the future, is already in progress.

Many dentists tell me that a significant number of their patients are being switched to one-year recare cycles by their dental plan administrators. Furthermore, many dentists report that new patient flow is gradually decreasing, while the number of emergency patients is increasing. This trend reflects the fact that an increasing number of Canadians have fewer dental benefits than they did in the past. Without effective dental plans to help defray treatment and recare costs, more Canadians are choosing to participate less frequently in oral health care.

Based on a survey that Exper-Dent conducted last year, the average recare visit takes about 50 minutes. Assuming that a full-time hygiene schedule runs to about 128 hours of chair time per month, a fully appointed hygienist could treat about 921 patients per year, provided the mix of three-, six-, nine- and 12-month recare patients averaged out to about two visits, per patient, per year. After making allowances for new patient visits, as well as a controlled level of downtime, one hygienist could likely treat about 800 participating patients in a year.

The results of our survey showed that the average hygienist actually provides care to about 1,108 participating patients, with the average "range" being from 860 to 1,350 patients (**Fig. 1**). Since most dentists have between 1,500 and 2,500 patients in their practice, it is no surprise that many lean toward a practice model based on one dentist, and four to eight hygiene days per week. The exact number of hygiene days depends on the practice's management efficiency as well as the care needs of its patient base.

Ongoing changes in the health and dental plans of Canadian workers' packages may cause havoc for any practice that relies too heavily on dental benefits to guide the pattern of patient visits. One-year recare cycles will require more patients to support each hygienist. As participation rates decrease and recare cycles lengthen, many practices will be faced with a choice of either increasing the volume of patients in the practice or reducing the number of hygienists.

It is generally difficult to dramatically increase the patient base of the practice. In the United States, many practices facing this dilemma have turned to managed care programs to "boost" their patient flow and "fill in the gaps" in their schedule. The consequences have been far less than stellar, because managed care also forces participating practices to accept a lower fee schedule. So, even though the patient base of the practice has grown significantly, production often goes down.

Reducing the number of hygienists in the practice is also an unattractive option. The flow of patients through the hygiene chairs is vital to identify and present treatment for the clinical chairs. Halving the number of hygienists in a practice could have a serious impact on the dentist's own productivity. This loss, coupled with the lost production from the hygiene schedule, could push many practices to the brink of financial disaster. At the very least, a large number of dentists may see their take-home income drop substantially.

The only true solution to protect your practice against these pressures is to develop a quality patient base that is committed to regular care based on their health needs ... not insurance benefits. In practice management, we often talk about developing patient loyalty to the practice. Instead, our first priority should be to develop patient loyalty to their own mouths. Getting patients to make a personal commitment to their oral health is the first step to creating value for your practice. And, once value is established, most patients will stop relying on insurance (or the lack of it) to dictate their care decisions.

No one in your practice is better suited to help patients understand and commit to oral health than your hygienist(s). In the past 10 years, we have become very adept

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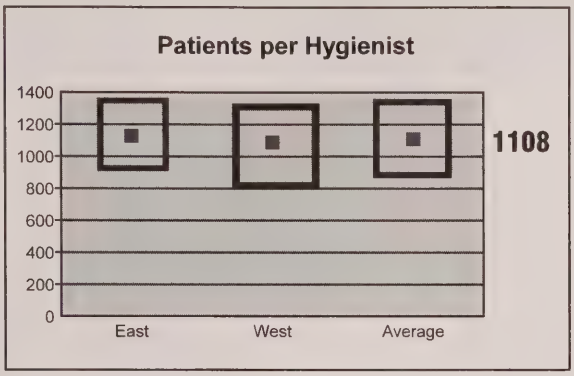

Fig. 1

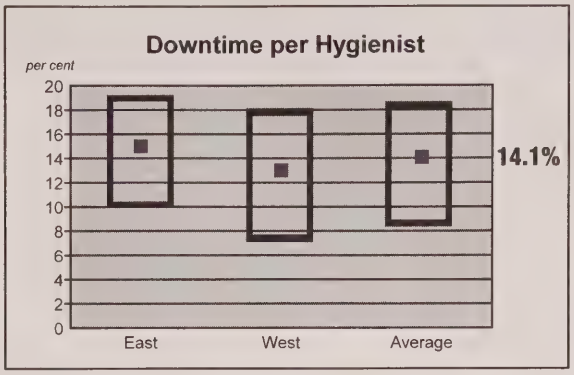

Fig. 2

at motivating hygienists to be productive. However, focusing solely on hygiene production is ill-founded. The true role of hygiene is far greater than simply being a profit centre. Hygienists must assist and support the diagnosis and acceptance of dentistry. The number one prerequisite for this is the presence of patients, and hygienists (through their ongoing recare with patients) have the best opportunity to promote patient flow and retention.

At some point in the past, dentists lost sight of the critical role that hygienists can play in marketing the practice. For example, if appointing non-participating patients for an extra 10 minutes of oral health education recovers 25 per cent of them into a participating status, you have come out ahead. A motivated hygienist with good verbal skills can achieve these results. Here are some other marketing ideas that you can introduce in your hygiene department:

- Hygienists should take advantage of their downtime to make telephone calls to their patients who have overdue, no-show or cancelled appointments. When dentists tell me that their hygienists haven't the verbal skills to do this task, I ask them, "What verbal skills are they using with patients in the chair, then?"
- Hygienists should motivate and educate patients on the importance of their next visit. Ensure this information is written in the chart so that other team members have access to it.
- In the morning huddle meeting, identify the non-participating patients who can be transferred from the clinical chair to fill openings in the hygiene chair(s). Use part of this time to communicate, educate and build retention.
- Ensure that your hygienists understand the numbers behind the patient base. They should examine how the patients assigned to them are categorized. If their portion of the participating patient base is not growing, they are not marketing effectively.
- To create value, hygienists should verbally validate the dentist's findings and treatment plans to the patient. Similarly, the dentist should do the same with respect to the hygienist's treatment. Opportunities to discuss treatment should be coordinated between dentists and hygienists during the morning huddle.
- Make "care" calls to patients who had long or difficult appointments. Compliment the patient on positive decisions. Learn how to ask for referrals.

To any hygienist who is not already performing these tasks, this approach may sound daunting. However, all it takes is a few moments during each patient visit to make a difference. At the start of each day, your hygienists should review their schedules and plan a little bit of marketing into each visit. Most importantly, downtime must always be spent on tasks that build retention.

Our survey last year showed that the average hygienist in Canada had more than 14 per cent downtime in their schedule, with an average "range" from 8.6 to 18.5 per cent (**Fig. 2**). In other words, more than one hour every day is available to the average hygienist to work on tasks like marketing and retention.

With external forces eating away at the quality of your patient base, many hygienists will come to realize that their jobs must involve marketing the practice, developing the patient base and improving retention. In the long run, how effectively both dentists and hygienists integrate these tasks into each patient contact will likely determine who wins or loses the battle of declining participation. Practices that work hard, stay focused and get patients to make a real commitment to lifelong oral health will be able to keep their heads above the wave of practices being swept downstream by changing market dynamics. ■

Imtiaz Manji is a principal of Exper-Dent Consultants Inc., 80-10551 Shellbridge Way, Richmond, B.C. V6X 2W9 Tel.: (604) 278-5059, or fax: (604) 278-1406.

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Intra-Oral Cameras — The Next Step

Ken A. Neuman, DMD

"The secret of success in life is for a man to be ready for his opportunity when it comes."

— Benjamin Disraeli.

Dentists and allied dental personnel who choose to adopt the use of current technological advances can undoubtedly increase their opportunity for success. This "success" can be defined in many different ways. For one person, the satisfaction of knowing that they are doing the best they can to communicate to their patients is one form of success. For others, the fact that they can, for the first time, show their patients what they see, and make them part of the solution to their oral health-care problems is indicative of success. And for others, being on the leading edge of anything is their measure of success.

Intra-oral cameras have made these things possible for many dentists. Now, there is a strong move to encourage dentists who have purchased intra-oral cameras but are slow to maximize the use of their systems, to do so.[1] There are changes going on within the intra-oral camera market that will enhance the use of these tools even more, and create an abundance of potential for helping our patients understand what we are doing for them.

The two leaders in the intra-oral camera market, Insight Imaging (San Carlos, Calif.) and New Image Industries (Carlsbad, Calif.), are setting a standard that other camera companies will, no doubt, strive to meet. Both companies have introduced PC-based systems that have many advantages over the stand-alone, picture-taking only cameras that we have seen to date.

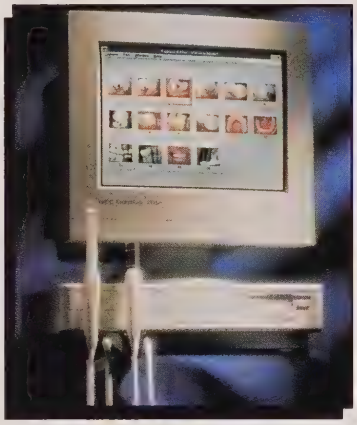

Fig. 1: The Insight Power 0/100 system.

Insight Imaging has introduced the Power 0/100 system (**Fig. 1**) which contains a powerful Pentium PC that offers many choices of expandability and processing power. It is designed to be used as a complete examination system, and allows the dental team to be more efficient and effective in their diagnostic procedures by enabling them to better communicate their patients' treatment planning requirements. The new system is voice-activated and allows the storage and organization of an almost unlimited amount of information. The software is Windows-based (Microsoft), and the Capture-It Plus program allows voice-activated image capture, storage, image modification, voice notes, and annotations to be made at the press of a button. The system integrates with Insight's Chart-It software, and the patient education multimedia program called Show-It, which is an interactive CD patient education system. During an examination you can save as many images as you want (**Fig. 2**), and then display your findings in a number of ways. For example, you can bring up one image at a time, side-by-side images, top-bottom images, or even the picture-in-picture images that many new TV monitors are capable of (**Fig. 3**). You can also rotate, enlarge, reduce, or show mirror images of photos.

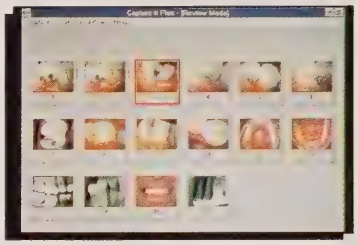

Fig. 2: The Insight Power 0/100 system showing multiple images captured.

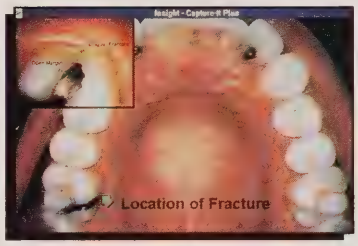

Fig. 3: The Insight Power 0/100 with picture-in-picture.

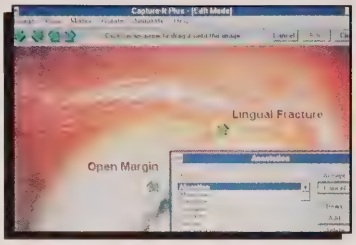

Fig. 4: The Insight Power 0/100 showing the annotation feature.

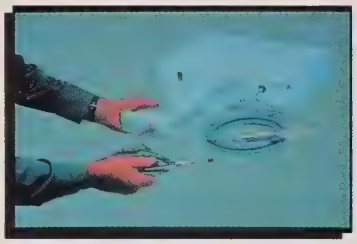

Fig. 7: The AcuCam docking station.

Flexibility is the key word for image manipulation on this new format. It is also possible to place a six-second voice annotation on any photo. When the photo is stored, a small symbol comes up in the lower right-hand corner of the image that indicates there is a voice note. To listen to the note, you need only touch the symbol and the note is heard over the system's speakers. This is a great advantage to offices that have their system in the hygiene room because vocal notes can be recorded during the examination and then listened to later when treatment plans are being formulated.

The annotation feature is also advantageous when sending photos for insurance purposes (**Fig. 4**). You can select text items from a menu and place them with an arrow in the appropriate direction to indicate such things as "cracked filling," "open margin," and/or "fracture." The list of text options can be edited and customized to suit the needs of individual dentists. Once you have customized your list, you need only touch the item and move it to where you want it to appear on the photo.

The flexibility continues with Insight's Multilink system (**Fig. 5**). Through the use of a portable wall-mounted system, you can electronically network all of your operatories to a central station with one camera. You simply slide the unit into a wall-mounted docking station and it is ready to use. The Power-It PC system comes with the following configuration:

- 90 MHz Pentium computer
- 16 MB RAM memory
- 730 MB hard drive
- 3.5" 144 MB floppy drive
- Video capture board
- 15" SVGA monitor
- Voice-activated control with headset
- Keyboard and mouse
- All-function foot pedal
- Cables and surge protector

Fig. 5: Insight's Multilink system.

Fig. 8: The Socrates multimedia patient education program.

Watch for the release of a new product from Insight in the spring of 1996, that will allow cosmetic imaging to be added to this program.

The second of the two leaders in the industry, New Image Industries, has also introduced many new features to enhance their world-leading camera, the AcuCam. They have introduced the AcuCam PC Plus, a computer-based system that adds to the capability of traditional camera systems.

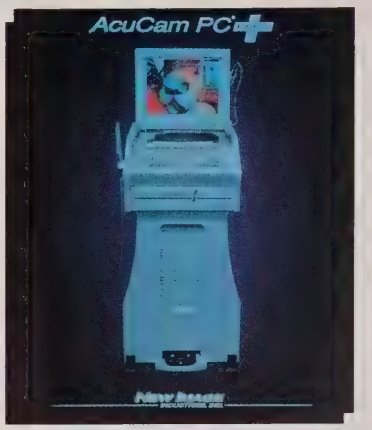

Fig. 6: The AcuCam PC Plus system.

The AcuCam PC Plus (**Fig. 6**) allows you to store an infinite number of photos, and to retrieve them rapidly. Voice notes are also built into the PC Plus system, and, as mentioned previously, this feature creates a new dimension of flexibility to the system. Other capabilities of the PC system include zoom features, and the integration of photos into correspondence or recall letters. Printed images can be annotated with the name of the doctor, practice name, phone number, and the patient's name.

The AcuCam PC Plus comes with the following configuration:

- 486 CPU
- 16 MB RAM
- 525 MB hard drive
- SVGA color monitor
- Scan converting image processing board
- Keyboard and mouse
- Two-position foot pedal

New Image has also introduced a docking station (**Fig. 7**) that allows one camera to be used in multiple operatories. The docking station is light, and easy to place and remove from its station. Voice-activated perio charting is also possible through the AcuChart system which allows full perio and restorative charting through voice commands.

Another innovative device by New Image is their portable Digital X-Ray System that allows an 85 per cent decrease in radiation exposure.

The AcuView Imaging system is one of the oldest imaging systems on the market. It has been refined

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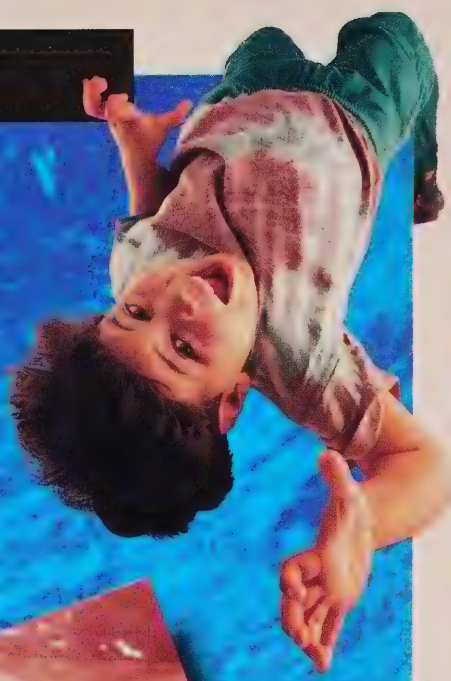

Dentistry by: Dr. Frank Garcia-Godoy, University of Texas at San Antonio

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Fig. 9: The Professor — a laser disc patient education program.

Fig. 11: The Caesy program showing a photo from the implant section.

and updated to make it undeniably the best and easiest to use imaging system available. Interest in cosmetic imaging is on the rise, and these systems will, no doubt, become a standard component in the armamentarium of dentists who focus on cosmetic dental procedures.[2] New Image has also updated their multimedia patient education program, Socrates (**Fig. 8**).

While these two companies are the leaders in the intra-oral camera industry, there are several other systems that should be examined when you are looking for multimedia patient education programs. A Canadian product, called "the Professor" (**Fig. 9**), which is available on laser disc, provides information on multiple topics that are very well explained in two- or three-minute segments.[3] This system can be plugged into an intra-oral camera monitor, or can be used as a stand-alone unit plugged into a television monitor. Caesy (**Fig. 10**) is another CD-ROM, or CD-i system that can be used in existing set ups and should be examined as an adjunct to patient education devices (**Fig. 11**). Photography in the Caesy programs was supplied by three leading cosmetic dental clinicians.[4] Another CD-i program, called Touchcare (**Fig. 12**), was developed by Dr. Rob Strain.

Fig. 10: The Caesy patient education system.

Fig. 12: The Touchcare system menu pad.

The next logical step for intra-oral camera companies is the total integration of existing systems capabilities with those of dental management systems. This is inevitable, and it would not surprise me to see Insight Imaging and New Image Industries at the forefront. Stay tuned and keep listening, because, as we close in on the next century, the only constant we will have is change. ■

Dr. Ken A. Neuman maintains a general practice with an emphasis in cosmetic dentistry in Vancouver, B.C.

Reprint requests to: Dr. Ken A. Neuman, 101-2732 West Broadway, Vancouver, B.C. V6K 2G4

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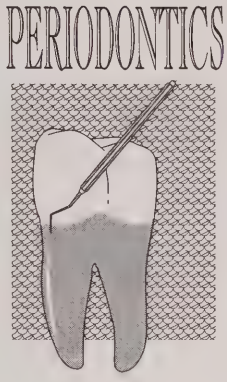

Periodontal Manifestations of Systemic Diseases and Their Management

David Michelberger, DDS

Debora Matthews, B.Sc., DDS, Dip. Perio.

ABSTRACT

Periodontal diseases result from the response of the host's periodontal tissue to the bacterial toxins present in dental plaque. Several systemic diseases have been shown to influence the course and severity of periodontal diseases by altering the inflammatory response of the host. This paper focuses on the manifestations and dental management of periodontal diseases when these types of systemic conditions, including diabetes mellitus, hormonal changes of pregnancy and puberty, HIV-associated infection, and various blood dyscrasias, are present.

SOMMAIRE

Les maladies parodontales proviennent d'une réaction des tissus parodontaux qui servent d'hôtes aux toxines bactériennes présentes dans la plaque dentaire. Il est démontré que plusieurs maladies systémiques influent sur le cours ou sur la gravité des maladies parodontales en modifiant la réaction inflammatoire du sujet. Dans cet article, on se penche sur les manifestations et sur la gestion dentaire de ces maladies lorsque sont présentes des conditions systémiques semblables, y compris le diabète sucré, les changement hormonaux associés aux grossesses ou à la puberté, les infections associées au virus HIV et divers troubles de la crase sanguine.

Introduction

It is well documented that the etiological agent of periodontal disease is bacterial plaque. This plaque produces toxins and enzymes, which in turn elicit inflammatory and immunological alterations in the periodontal tissues of the host. These host responses can be influenced by a variety of systemic factors, thus certain systemic diseases can also affect the periodontal tissues.[1]

While many rare systemic diseases have periodontal manifestations, this paper will discuss only the periodontal presentations of those conditions likely to be encountered in an average clinical practice, such as diabetes mellitus and alterations in sex hormone levels, as well as less common diseases such as HIV-associated infection, neutropenia and leukemia. The periodontal management of patients affected by these diseases is also outlined.

Diabetes Mellitus

Diabetes mellitus has long been considered as an important risk factor for periodontitis. The disease is the result of an endocrine disorder characterized by glucose intolerance, and may be accompanied by long-term complications such as angiopathy, nephropathy, neuropathy and retinopathy.[1-4] It is classified into insulin-dependent (IDDM or Type I) and non-insulin-dependent (NIDDM or Type II) diabetes.

Although many studies have attempted to determine the effect of diabetes on the development and severity of periodontal disease, varying results have been reported. This may be due to a failure to control for any number of confounding factors, including metabolic control, age of onset and duration of the disease, racial predilection, and smoking.[4-10]

Insulin-Dependent Diabetes Mellitus (IDDM)

This form of diabetes occurs when autoimmune reactions, genetics or an environmental insult result in a relative deficiency, or lacking, in the insulin secreted from the pancreatic beta cells. Patient management consists of daily insulin injections and diet control.[1-3]

Although not all patients with diabetes develop periodontal problems, poorly-controlled diabetics typically develop more severe periodontitis than their well-controlled counterparts.[5,6] Furthermore, the severity of periodontal disease in diabetic patients appears to be positively correlated to the duration and the age of onset of their diabetes.[7,8] A recent Swedish study[8] observed that a group of 40- to 49-year-old diabetics had significantly more 6.0 mm pockets and bone loss than

their non-diabetic analogues. They also exhibited more severe periodontitis than older patients with IDDM. However, the metabolic control of the diabetic patients — a factor that may influence the severity of disease — was not accounted for.[5,6] Seppälä et al[5,6] found that poorly-controlled diabetics had more gingivitis, higher bleeding scores, more gingival recession, and more alveolar bone and attachment loss than controlled diabetics.

These studies show that the metabolic control of diabetes is an important factor in the pathogenesis of periodontal disease. Researchers have also examined the effect of periodontal health on the underlying diabetes. Miller et al[11] reported observing a link between improved periodontal health and improved metabolic control of diabetes in poorly-controlled IDDM patients. However, Aldridge et al[12] found that periodontal treatment did not affect metabolic control in stable IDDM patients with advanced periodontal disease. The conflicting results of these two studies may be attributed to different treatment protocols and, more importantly, the inconsistent severities of diabetes in the patients monitored.

While it has been shown that IDDM is a risk factor for periodontitis, and that poor metabolic control, earlier age of onset and longer duration of diabetes are associated with an increase in the severity of periodontal disease, the effect of periodontal health on the metabolic control of diabetes remains unclear.

Non-Insulin Dependent Diabetes Mellitus (NIDDM)

The pathogenesis of non-insulin dependent diabetes involves either insufficient or delayed insulin secretion or a peripheral resistance to insulin.[3] This form of diabetes is usually controlled medically by diet modification alone, or by diet modification in combination with hypoglycemics.[1,2]

Emrich et al[9] observed the periodontal manifestations of NIDDM in 1,342 Pima Indians. Periodontal destruction was more prevalent, and of greater severity, in subjects with NIDDM than in non-diabetics. In fact, the relative risk of developing periodontal disease was three times higher for patients with NIDDM than for healthy subjects.

Table I

Management Of the Diabetic Patient

1. Metabolic Control
• if poorly controlled, consider referral and/or hospitalization for extensive procedures
2. Stress Reduction
• schedule early morning appointments
• ensure profound local anesthesia
3. Diet Modification
• ensure patient has a nutritional meal prior to appointment
• diet may need to be modified if dental procedure results in compromised mastication or swallowing
• ensure that diet after procedure fulfills nutritional requirements
4. Systemic Antibiotics
• tetracyclines may be drugs of choice depending on type of infection and metabolic control of patients
5. Regular Maintenance Care
• every three months in patients with attachment loss
• every six months in patients with gingivitis

Management Of Diabetic Patients

The management of both Type I and Type II diabetics is outlined in **Table I**.[13] In most cases, patients with controlled diabetes can receive the same dental treatment as non-diabetics. However, with diabetic patients, it is important to maintain normal serum glucose levels to avoid a hypoglycemic episode. A key factor in maintaining metabolic homeostasis is stress reduction. This is accomplished through relaxation methods, early morning appointments, and profound anesthesia.

Early morning appointments should be scheduled to avoid complications arising from diurnal fluctuations of serum glucose levels (a function of administered insulin, caloric intake and the metabolic use of glucose). Patients should be instructed to follow their usual insulin regimen, eat a normal breakfast, and minimize glucose usage by keeping daily activities to a minimum prior to the dental appointment.[14] Following dental treatment, the patient's diet may need to be modified if it appears that chewing may be compromised. It is important for the patient's dietary requirements to be met, even if he or she is placed on a soft or liquid diet.

Poorly-controlled diabetics, or those with severe infections, should consult their physician to assess the need for hospitalization or possible prophylactic antibiotic coverage.[13] Although prophylactic antibiotic coverage is generally not necessary for well-controlled patients, the extent of the surgical procedure and the patient's propensity for infections should be taken into account. Increased gingival collagenolytic activity has been associated with diabetes. Tetracyclines such as minocycline or doxycycline, which have been shown to inhibit collagenase, may be the drugs of choice.[15-17] Doxycycline may be preferred because it is not metabolized in the kidneys. However, no controlled clinical trials have been performed in a diabetic population to validate this. Once periodontal health and integrity are restored, the patient must be placed on a recall maintenance program.

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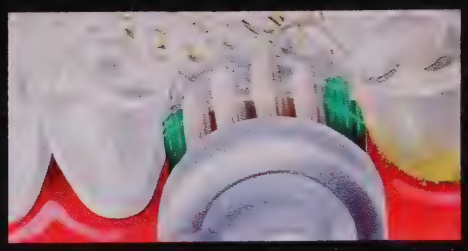

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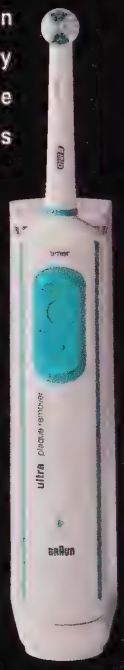

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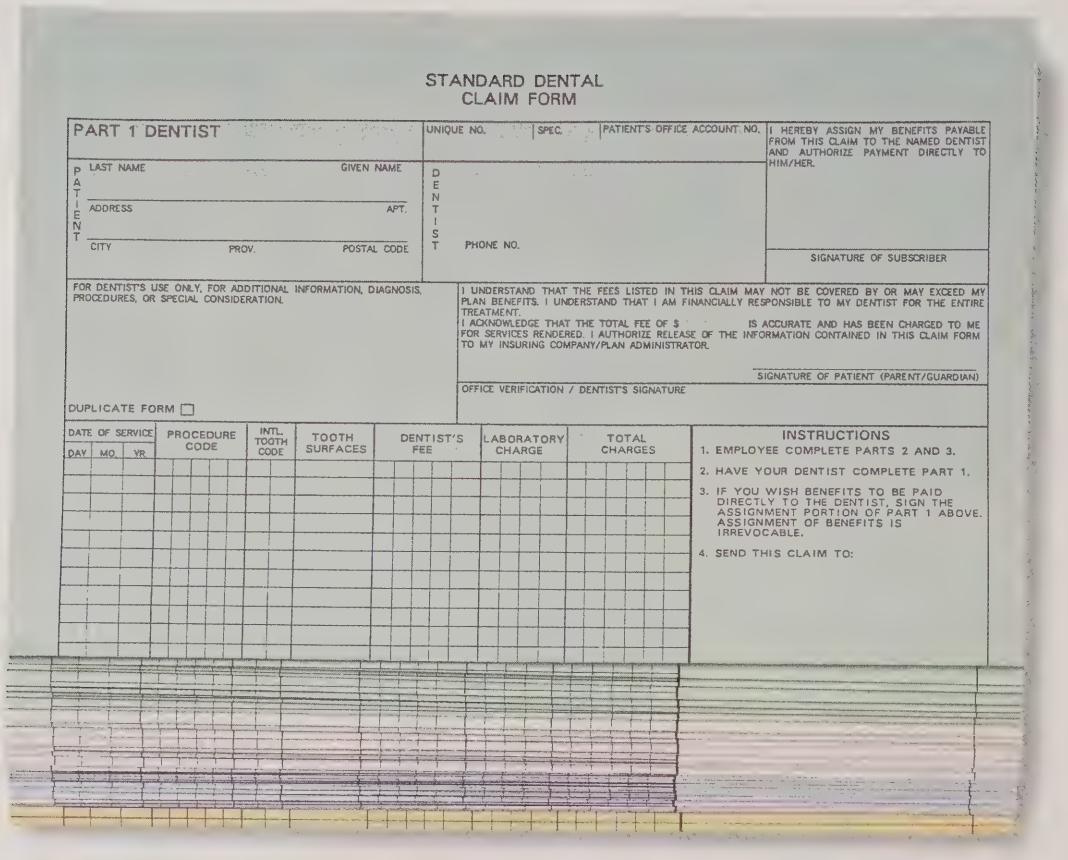

STANDARD DENTAL CLAIM FORM

PART 1 DENTIST

UNIQUE NO. | SPEC. | PATIENT'S OFFICE ACCOUNT NO.

I HEREBY ASSIGN MY BENEFITS PAYABLE FROM THIS CLAIM TO THE NAMED DENTIST AND AUTHORIZE PAYMENT DIRECTLY TO HIM/HER.

PATIENT: LAST NAME | GIVEN NAME | ADDRESS | APT. | CITY | PROV. | POSTAL CODE

DENTIST: PHONE NO.

SIGNATURE OF SUBSCRIBER

FOR DENTIST'S USE ONLY, FOR ADDITIONAL INFORMATION, DIAGNOSIS, PROCEDURES, OR SPECIAL CONSIDERATION.

I UNDERSTAND THAT THE FEES LISTED IN THIS CLAIM MAY NOT BE COVERED BY OR MAY EXCEED MY PLAN BENEFITS. I UNDERSTAND THAT I AM FINANCIALLY RESPONSIBLE TO MY DENTIST FOR THE ENTIRE TREATMENT.
I ACKNOWLEDGE THAT THE TOTAL FEE OF $ IS ACCURATE AND HAS BEEN CHARGED TO ME FOR SERVICES RENDERED. I AUTHORIZE RELEASE OF THE INFORMATION CONTAINED IN THIS CLAIM FORM TO MY INSURING COMPANY/PLAN ADMINISTRATOR.

SIGNATURE OF PATIENT (PARENT/GUARDIAN)

OFFICE VERIFICATION / DENTIST'S SIGNATURE

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Table II

Management Of Pregnancy Gingivitis

1. Maintain Oral Health
• oral hygiene instruction
• scaling and root planing as required
2. Pregnancy Tumor (Granuloma)
• pregnancy granuloma will involute with parturition
• excise (in second trimester) if it is interfering with oral hygiene, mastication or esthetics

The Influence Of Changes In Sex Hormones

Pregnancy Gingivitis

Approximately 50 per cent of pregnant women are affected by pregnancy gingivitis.[18] This condition is characterized by an exaggerated response to plaque, with resultant gingival enlargement, erythema and edema.[19] The etiology of pregnancy gingivitis has been attributed to several factors, including: physiological changes in the serum concentrations of the female sex hormones during pregnancy, alterations in the composition of plaque during pregnancy, and maternal immunosuppression during pregnancy.[20-22]

Hugoson[20] performed a longitudinal investigation to determine how physiological changes in the serum concentration of female sex hormones influence gingival health during pregnancy. Although the women he studied had gingivitis during their pregnancy, the periodontal areas that were originally healthy did not become inflamed. Where inflammation did occur during normal pregnancy, the degree of inflammation varied significantly with sex hormone levels.

Several mechanisms by which increased levels of estrogen and progesterone affect the gingival status of pregnant women have been postulated. Lindhe and Brånemark[23,24] found that the local application of these hormones stimulates angioneogenesis and results in endothelial damage which, in turn, increases vascular permeability. Ojanotko-Harri et al[18] found that a higher level of progesterone is present in the inflamed gingiva of pregnant women than in non-pregnant women, as a result of a decrease in the metabolism of progesterone in the gingiva during pregnancy.

The composition of plaque may also contribute to the development of pregnancy gingivitis. Kornman et al[21] compared the bacteriology of plaque in pregnant and non-pregnant women. Their work showed that a more anerobic flora evolves as pregnancy progresses, with a significant increase in *Prevotella intermedius*. The elevated levels of this particular bacteria may be attributed to the fact that progesterone and estrogen levels increase during pregnancy, as these hormones substitute for menadione as an essential growth factor for *Prevotella intermedius*.[25] This suggests that hormonal changes not only alter the immune response to plaque, but may also lead to changes in the microbial composition of plaque.

Gestational immune suppression may also contribute to the development of pregnancy gingivitis. It has been postulated that the inflammatory response of the gingiva toward plaque is altered by the depression of T-cell responsiveness during pregnancy.[22] Raber-Durlacher et al[26] placed subjects on a comprehensive oral hygiene program to establish a baseline for gingival health. At the 25th week of pregnancy and at six months post-partum, the subjects were instructed to abstain from oral hygiene for two weeks. The level of bleeding on probing was higher during pregnancy than at six-months post-partum, despite similar plaque indices for the two time periods. A histological examination of the interdental papillae indicated that a higher number of CD4 positive T-cells were present during pregnancy gingivitis than at the corresponding post-partum phase. This increase in the population of CD4 positive T-cells may be a contributing factor to the exaggerated gingival inflammatory response seen during gestation.

Table III

Classification of HIV-Associated Gingivitis and Periodontal Disease

1. HIV-Associated Gingivitis
A. Gingivitis Associated With Bacteria and Yeast
• Conventional chronic gingivitis
• Chronic gingivitis with bandshaped and/or punctate erythema
• Acute necrotizing gingivitis
B. Gingivitis Caused by Viruses
• Herpetic gingivostomatitis
• Herpes zoster
2. HIV-Associated Periodontitis
• Conventional adult periodontitis/rapidly progressive periodontitis
• Acute necrotizing periodontitis

The etiology of pregnancy gingivitis appears to be multifactorial. It can be attributed to gestational increases in gingival progesterone levels due to decreased metabolism, the alteration of plaque composition to a more anerobic microflora, and altered T-cell function.

Management Of Pregnancy Gingivitis

As the inflammatory response to local irritants is often exaggerated in pregnant patients (**Table II**), the most important objective in the dental management of these individuals is to establish and maintain a healthy oral environment.[2] The relationship between periodontal disease and pregnancy must be explained to the patient, and good oral hygiene should be demonstrated and reinforced. Coronal scaling and root planing can be safely performed during all three trimesters, and should be provided when necessary.

Puberty-Associated Gingivitis

A correlation between puberty and gingivitis has also been investigated, and various hypotheses have been suggested. It was previously believed that an unbalanced secretion of estrogen and progesterone during puberty was a factor in the development of pubertal gingivitis.[27] However, a more recent study showed that the presence of plaque may be more important. Tiainen et al[28] found that gingival bleeding and visible plaque scores decreased between the ages of 14 and 16, and that there was a significant correlation between the presence of plaque and bleeding scores. However, no correlation was found between gingival bleeding and the stage of puberty. The authors concluded that the influence of hormones on gingival health during puberty is negligible, whereas poor oral hygiene and the presence of plaque are much more important.

The microbial composition of plaque may also play a role in the development of puberty gingivitis. Wojcicki et al[29] investigated the microbial profiles of plaque relative to the clinical appearance of the gingiva during various stages of sexual maturation. Forty-two healthy children, aged seven to 19 years, were stratified into pre-pubertal, circumpubertal and post-pubertal groups. The plaque samples collected from the post-pubertal group demonstrated a significantly greater number of motile rods and spirochetes than the samples from the other groups. *Prevotella intermedius* counts were significantly higher in the circumpubertal group, however, which is similar to the results of Delaney and Kornman.[30] In contrast to Tiainen's study, this latter finding was associated with an increased gingival bleeding index.

While there is no equivocal answer on the influence of hormone levels on periodontal disease during puberty, the presence and composition of plaque, specifically an increase in the numbers of *P. intermedius* colonies, appears to be a significant factor in the development of pubertal gingivitis.

Table IV

Management Of HIV-G and HIV-P

1. Debridement
• initiate quadrant scaling and root planing and povidone-iodine irrigation with local anesthesia as required
• remove bony sequestra if necessary
2. Local Antimicrobial Therapy
• 0.12 per cent chlorhexidine mouthrinses — 15 mL bid
3. Systemic Antimicrobial Therapy
• metronidazole 250 mg QID for four to five days for patients with systemic manifestations and/or acute necrotizing periodontitis
• avoid all broad spectrum antibiotics (penicillin, erythromycin, tetracycline)
4. Immediate Follow-Up Care
• 24 hours a. oral hygiene instruction: toothbrushing, flossing, interproximal devices b. continue debridement
• Seven to 10 days a. complete debridement
5. Long-Term Maintenance
• monthly recall appointments until disease progression is stabilized
• every three months thereafter

Management Of Puberty-Associated Gingivitis

Supportive management consisting of oral hygiene instruction as well as routine professional cleaning is fundamental in managing pubertal gingivitis. It is important to distinguish puberty-associated gingivitis from juvenile periodontitis, since they both have pubertal onsets. This is simplified by the differences in the etiology and management of these conditions. Juvenile periodontitis is characterized by severe angular bony defects and the destruction of the connective tissue attachment, which is usually localized to the first permanent molars bilaterally and, sometimes, to the incisors.[31] Recording clinical probing depths in all teenagers, and updating bitewing radiographs as required, allows the clinician to distinguish between the two diseases.

HIV Infection

Oral manifestations are often the first clinical expression of HIV infection. Although many studies have monitored periodontal dis-

Table V

Periodontal Maintenance of Leukemic Patients

• mechanical removal of plaque and calculus
• 0.12 per cent chlorhexidine mouthrinses — 15 mL bid
• regular periodontal maintenance care

ease in HIV-infected patients, the number of well-controlled studies is minimal. This is due to the differences in immunodeficiency levels between patients, and their use of multiple medications.

Holmstrup et al[33] recently devised a descriptive classification system to overcome the previously inconsistent classification and terminology given to HIV-associated periodontal diseases (**Table III**).

1. HIV-Associated Gingivitis (HIV-G)

A. Gingivitis Associated with Bacteria and Yeast

Conventional chronic gingivitis: This form of gingivitis is characterized by a red or bluish-red edematous gingiva, and is often accompanied with swollen interdental papillae.[33]

Chronic gingivitis with band-shaped and/or punctate erythema: This form of gingivitis consists of a distinctive (occasionally punctate) erythema of the free and attached gingiva and the alveolar mucosa, and is characterized by a fiery red band along the gingival margin.[32-35] The lesions most frequently involve the entire mouth but may be localized.[33]

Acute necrotizing gingivitis: This condition has been described by EEC-Clearinghouse on Oral Problems Related to HIV-Infection as a localized or generalized ulceration, necrosis and/or destruction of interdental papillae, covered with a fibrinous slough.[33]

B. Gingivitis Caused by Viruses

Herpetic gingivostomatitis: The characteristic manifestation of this condition includes gingival and mucosal vesicles that rupture, coalesce and leave painful irregular ulcers. Management consists of acyclovir tablets, 200 to 400 mg, five times per day, which should be prescribed by a specialist with expertise in this area.[33]

Herpes zoster (shingles): This condition is caused by the reactivation of varicella-zoster. The primary disease associated with this virus is known as varicella (chicken pox), and is usually contracted during childhood.[36] In HIV patients, herpes zoster, or shingles, is characterized by unilateral pain, vesicular eruption and eventual ulcerations in the affected area. These manifestations may also be accompanied with osteonecrosis. Treatment, consisting of acyclovir, should be undertaken by a medical or dental specialist with expertise in this area.[33]

2. HIV-Associated Periodontitis (HIV-P)

Holmstrup et al[33] classify HIV-P into two subgroups: conventional adult periodontitis/rapidly progressive periodontitis, and acute necrotizing periodontitis. These conditions are often jointly referred to as HIV-P, however, because not all reports distinguish between patients presenting with or without tissue necrosis. HIV-P is associated with severe deep pain, gingival bleeding, soft tissue necrosis, and rapid destruction of the periodontal attachment apparatus, in addition to the features of HIV-G. Affected areas often do not show deep pocket formation, as severe gingival necrosis usually coincides with loss of the crestal alveolar bone.[32] Since the microbiologic profiles of HIV-P are similar to that of conventional periodontitis, the accelerated mode of HIV-associated periodontitis may be due to the impairment of host responses.[33]

Management Of HIV-G and HIV-P

Table IV, adapted from Winkler et al,[32] outlines the management of patients with HIV-G and HIV-P. Management consists of debridement, local antimicrobial therapy, systemic antimicrobial therapy, immediate follow-up care and regular long-term maintenance. The debridement phase involves the removal of plaque, calculus, necrotic soft tissues and bony sequestra. The use of povidone-iodine is helpful, since it provides relief of acute pain in addition to acting as a debriding agent. Local antimicrobial therapy using 0.12 per cent chlorhexidine is valuable in the long-term maintenance of HIV-associated periodontal lesions, and should be initiated as soon as possible. Systemic antibiotics — in particular metronidazole 250 mg, four times a day, for four to five days — should be administered to patients who exhibit systemic manifestations and/or acute necrotizing periodontitis. The use of broad-spectrum antibiotics such as penicillin, tetracyclines and erythromycin is not recommended in HIV patients, however, due to the potential for opportunistic fungal infections.[33] Immediate follow-up care is essential to treatment success in patients with HIV-associated periodontal diseases. Ideally, patients should return within 24 hours for an oral hygiene evaluation and additional debridement. Thereafter, they should have two more appointments, seven to 10 days apart, to undergo the required root planing, as well as additional debridement. Since extensive tissue destruction results in soft tissue defects that are difficult to keep clean, patients should be encouraged to use interproximal devices such as proxy brushes to facilitate oral hygiene.

The need for long-term periodontal evaluation varies among patients. Monthly recall appointments should be scheduled until the condition is stabilized. Thereafter, most patients can be seen for follow-up every three months. Recurrence is common if patients do not adhere strictly to their oral hygiene regimen.

Hematological Disorders

Neutropenias

Neutropenias are a family of diseases characterized by a decrease or absence of circulating PMNs or leukocytes. These condi-

tions may be idiopathic, familial, secondary to viral or bacterial infections, or drug-induced.[1,37]

Periodontal manifestations have been associated with cyclic neutropenia, chronic idiopathic neutropenia and benign familial neutropenia.[1,37-40] These types of neutropenias have common clinical presentations, including generalized gingivitis with enlarged, edematous, hemorrhagic gingiva, recession and deep periodontal pocketing. Extensive bone loss and mobile teeth have also been reported.[37-40]

Management of Patients With Neutropenia

The treatment of neutropenic patients consists of extracting teeth with a poor prognosis, stabilizing mobile teeth with wire/mesh-composite splints to improve comfort and function, thorough mechanical debridement, and chlorhexidine rinses. Regular maintenance visits are necessary to prevent further attachment loss.[37-40]

Leukemia

Leukemia is a general term used to describe a family of malignancies of leukocytes that result in an increase in the number of leukocytes. This condition can be classified as acute or chronic, and further subdivided as myeloid, lymphocytic or monocytic according to the types of cells involved. Leukemia has a pronounced effect on the periodontium. Clinical manifestations include gingival enlargement, gingival hemorrhage and periodontal abscesses.[1] Various researchers have described the enlarged gingiva as being boggy, edematous and very sensitive to palpation.[41] The incidence of gingival enlargement ranges from 20 to 34 per cent in patients with acute monocytic leukemia, 10 per cent in acute myelomonocytic leukemia, four to eight per cent in acute myeloid leukemia, and two per cent in acute lymphocytic leukemia.[42] This enlargement is caused by leukocytic infiltration into the tissues, which coincides with an increase in the peripheral leukocyte count.[43] The gingival hemorrhage observed in leukemic patients results from the accompanying thrombocytopenia.[1] Due to the decrease in the number of circulating granulocytes, leukemic patients are at increased risk for periodontal infections. Furthermore, a leukemic patient with chronic periodontal disease is at risk of acute periodontal exacerbations during remission induction.[44]

The chemotherapy drugs administered to leukemia patients may also have direct and indirect stomatotoxic effects on the periodontium.[45,46] Direct effects are attributed to the high turnover rate and vulnerability of the oral mucosal cells, which results in mucosal thinning and ulceration.[45,46] This mucositis often appears five to seven days after chemotherapy is initiated, and may be accompanied with xerostomia.[46,47] The resulting breakdown of the mucosal barrier, with the subsequent formation of portals of entry for periodontal pathogens, renders the patient extremely susceptible to infection. Thus, the aim of treatment is to prevent periodontal breakdown, as well as to reduce the risk of bacteremias and septicemias.[45] Since the chemotherapy-induced granulocytopenia reduces the gingival and periodontal inflammation, the absence of clinical inflammation can be deceiving.[44]

Management Of Patients With Leukemia

The management leukemic patients consists of maintaining their oral health and preventing oral infections, since these patients are pancytopenic. The effectiveness of a preventive regimen involving chlorhexidine (CHX) on the periodontal health of leukemic patients has produced varying results. While Wahlin[48] found that CHX had no effect on gingival inflammation, McGaw and Belch[49] and Bergman et al[50] demonstrated that the use of CHX offered a significant advantage.

Bergman conducted a study to determine the influence of mechanical plaque control prior to a four-week course of 0.1 per cent CHX rinse, administered twice daily.[50] One group of patients received scaling, antibiotic prophylaxis and CHX, while a second group received only CHX. Scaling and CHX rinses resulted in a significant reduction in plaque and bleeding scores, whereas CHX rinses alone did not change either of the indices. This suggests that the subgingival plaque, which can only be removed by mechanical means, may account for the difference in periodontal health between the two groups. Thus, it is recommended that chemical plaque control be preceded by mechanical debridement as outlined in **Table V**. It is of utmost importance for the clinician to be cognisant of the side effects of CHX, and to inform the patient of possible consequences. These include: a metallic/bitter taste, transient staining of the teeth and oral mucosa, and possible interference with taste of foods.

Conclusion

Dental practitioners should be aware that a variety of systemic diseases may present with periodontal manifestations. Occasionally, such manifestations may lead the dentist to suspect a systemic condition that should be confirmed by a complete medical examination. For example, periodontal disease that is unresponsive to periodontal treatment or inconsistent with the local irritants present may be indicative of an underlying systemic condition. The periodontitis that accompanies systemic disease has been treated empirically with some success. In some instances, further research is required to develop treatment protocols. ■

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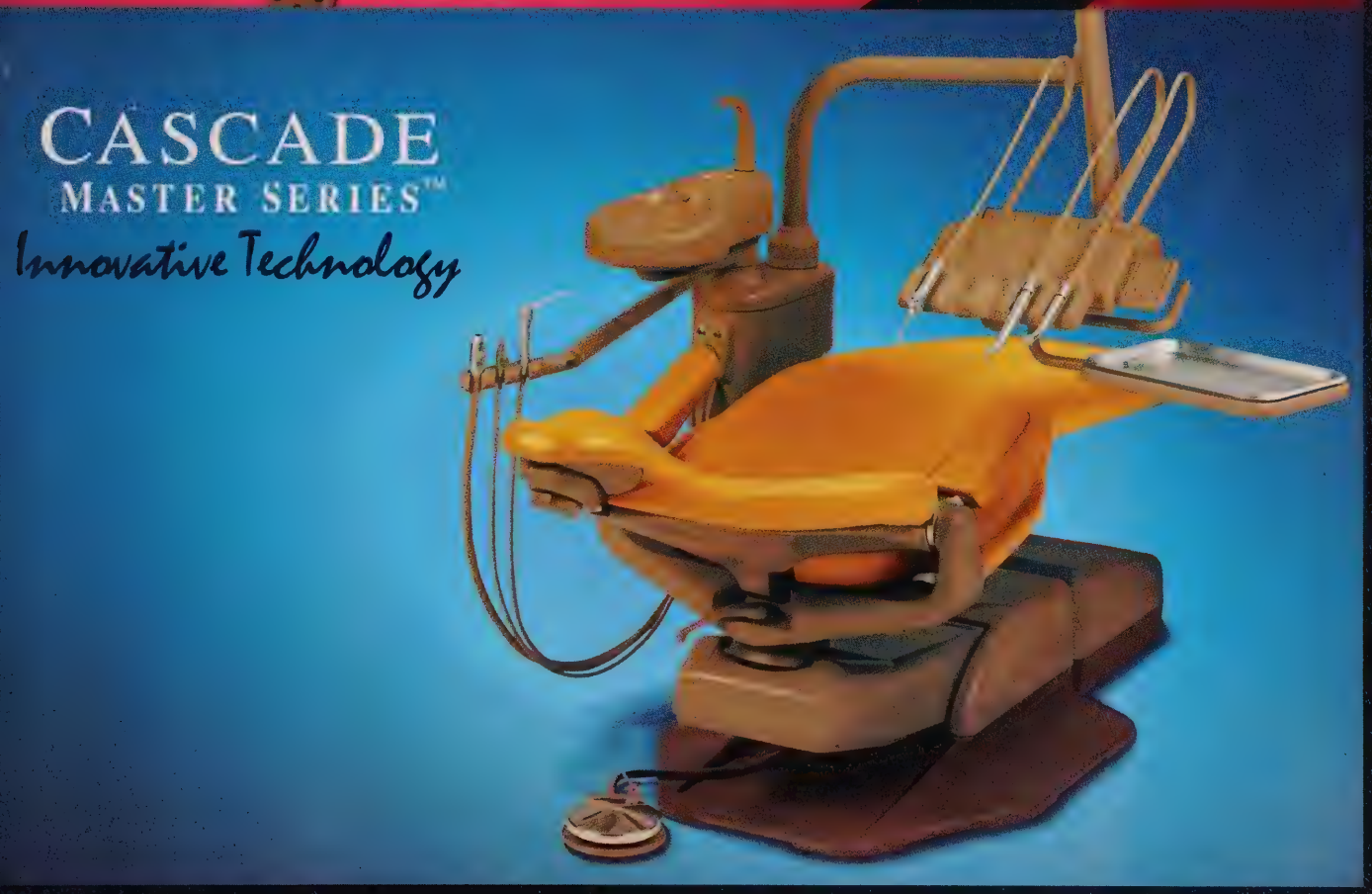

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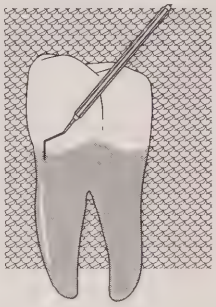

Topical Steroid Therapy In Oral Lichen Planus: Review Of a Novel Delivery Method In 24 Patients

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ABSTRACT

Lichen planus is a chronic mucocutaneous disorder of unknown etiology. The natural progression of oral lichen planus (OLP) is long and can extend over a number of years. Although many patients with OLP remain asymptomatic, some experience periods of marked inflammation with breakdown of the lesions, and require treatment. Corticosteroids are the mainstay of treatment for oral lesions, but delivery to affected mucosal sites can be problematic. The purpose of this study was to retrospectively review the results of topical steroid therapy in a group of patients with OLP, using a novel delivery method. The records of 33 patients with biopsy-proven OLP were reviewed and the relevant clinical features were noted at minimum review intervals of one, six and 12 months. Of this group, 24 patients had been treated using a standardized treatment protocol consisting of a corticosteroid ointment applied topically to mucosal lesions using cloth strips. Gingival lesions were treated using a steroid preparation in an adhesive paste. Nine patients remained asymptomatic and were not treated. In the treated group, 14/24 (58 per cent) of patients showed an improvement in symptoms by one month. The remainder showed no change or a worsening of their symptoms. Repetition of the treatment protocol resulted in improvement in all the non-responders, and by one year 23 of 24 (96 per cent) of the patients had experienced improvement or control of their symptoms. Long-term failure to control the symptoms in the single non-responding case was related to poor patient compliance. Results from this study show that a novel delivery method and treatment protocol for the application of topical steroids onto lesional mucosa is useful for the symptomatic control of oral lichen planus.

Key words: *steroids, lichen planus, oral, topical.*

SOMMAIRE

Le lichen plan est un désordre cutanéo-muqueux chronique dont l'étiologie est inconnue. La progression naturelle du lichen plan buccal (LPB) est longue et peut s'étendre à plusieurs années. Alors que de nombreux patients atteints de LPB sont asymptomatiques, certains connaissent des périodes d'inflammation marquée accompagnée de ruptures des lésions et ils ont besoin d'être traités. Les corticostéroïdes sont le principal remède pour les lésions buccales, mais leur application aux sites muqueux atteints peut présenter un problème. Cette étude avait pour but de réviser rétrospectivement les résultats d'une thérapie au stéroïde d'usage topique appliquée à un groupe de patients atteints de LPB suivant un mode de prestation nouveau. Ainsi, on a révisé les dossiers de 33 patients dont le LPB a été confirmé par biopsie et on a noté leurs caractéristiques cliniques pertinentes à des intervalles d'au moins un, six et 12 mois. Dans ce groupe, 24 patients ont été traités suivant un protocole normalisé comprenant l'application topique d'un onguent à base de corticostéroïde aux lésions muqueuses à l'aide de bandes de tissu. Les lésions gingivales ont été traitées à l'aide d'une préparation à base de stéroïde mêlée à une pâte adhésive. Neuf patients sont demeurés asymptomatiques et n'ont pas été traités. Parmi ceux qui l'ont été, 14 sur 24 (58 pour cent) ont vu leurs symptômes s'atténuer en un mois. Pour les autres, il n'y a pas eu de changement ou les symptômes ont empiré. En répétant le traitement, on a noté une amélioration chez les non-répondants et, après un an, 23 des 24 patients (96 pour cent) ont vu leurs symptômes atténués ou éliminés. Chez le seul non-répondant, l'échec à long terme a été dû à une pauvre observation des prescriptions. Les résultats de cette étude démontrent qu'un mode de prestation nouveau et un protocole de traitement pour l'application de stéroïdes à usage topique sur les lésions muqueuses est utile pour supprimer les symptômes du lichen plan buccal.

Mots clés: *stéroïdes, lichen plan, buccal, topique.*

Introduction

Lichen planus (LP) is an inflammatory, mucocutaneous disorder that affects 0.9 to 1.2 per cent of the general population.[1] LP primarily afflicts the middle aged, with the majority of cases occurring between the ages of 30 and 70. Although the condition does occur in children and adolescents, 35 per cent of all cases occur in patients over the age of 50.[2] The condition has a predilection for women, who account for 60 to 65 per cent of all reported cases.[1] Although oral lichen planus (OLP) may occur in the absence of cutaneous lesions, up to 36 per cent of those with oral lesions report cutaneous disease.[3]

Cutaneous LP lesions are classically described as polygonal, purplish and pruritic papules, usually occurring on the flexor surfaces of the extremities and abdomen. Within the mouth, LP lesions are primarily white and can be classified into one of several forms: reticular, papular, plaques, atrophic, erosive, bullous and ulcerative.[1,2] The most common form of OLP is the reticular pattern, followed by the atrophic form. The bullous pattern is rare.[4]

OLP occurs mainly bilaterally. It can affect, in order of declining frequency, the buccal mucosa, tongue and gingiva. The palatal and sublingual mucosa are rarely affected.[2]

Many patients with OLP are unaware of the condition, since up to one quarter of cases are asymptomatic. The majority of patients, however, are symptomatic and complain of discomfort of varying intensity, which may interfere with speech, mastication and oral hygiene practices.[1] The natural progression of the condition generally follows a chronic course. Without treatment, fewer than three per cent of patients undergo spontaneous remission in a mean time of four years.[4]

The etiology of LP is unknown. The condition may represent a cell-mediated immunological response to an induced antigenic change in the skin or mucosa.[5,6] Other theories have been suggested, including autoimmunity, genetic factors, drug induction, bacterial or viral infection, liver disease, diabetes, psychogenic factors and contact allergy, but none have been proven.[3,7-10] In view of the varied theories on the etiology of OLP, it is not surprising that the management of this condition is quite diverse. The most widely used therapy is topical corticosteroids, which are sometimes employed in combination with systemic steroids and/or antimycotic agents.[11] Alternatively, steroids have been injected into affected sites. Other treatments include the use of retinoids,[12] antifungal agents[13,14] and cyclosporin.[15] The efficacy of these treatments varies, perhaps because the delivery of topical agents to intraoral lesional sites can be problematic.

At this institution, all patients with OLP are treated with a standardized treatment protocol, which consists of applying topical steroid ointment directly to the lesions using cloth strips.[16] Gingival lesions are treated using a steroid ointment in an adhesive paste (Kenalog in Orabase). This treatment offers the advantage of delivering the topical medication directly onto the affected mucosa.

The purpose of this series was to review the results of a unique and uniform treatment protocol, in a group of patients with biopsy-proven OLP, over a follow-up period extending at least 12 months.

Materials and Methods

The records of 33 subjects were selected retrospectively from a pool of patients who were referred to the Sunnybrook Health Science Centre's dental department for the diagnosis and treatment of oral lesions. Inclusion criteria included biopsy-proven oral lichen planus with a clinical follow-up period of at least 12 months. Biopsies were performed on all patients at the initial consultation. The histopathological results were reviewed in each case to confirm the clinical diagnosis. The data collected included patient age, sex, duration of symptoms, presenting symptomatology, prior treatment, medical history and concurrent medications. The clinical appearance of the lesions was recorded at the time of diagnosis and classified into one of the seven clinical variants: reticular, papular, plaque, atrophic, erosive, bullous, or ulcerative.

Twenty-four patients were treated by two clinicians (R.J. and J.M.) with a standardized treatment protocol of topically-applied steroids. Nine remained asymptomatic throughout the review period and did not require treatment. All patients were followed-up clinically at intervals of one, six and 12 months.

Results

The 24 patients in the treatment group consisted of 14 women and 10 men. The majority (18/24, 75 per cent) were over the age of 50. All patients presented with intraoral lesions, but one patient also reported concurrent skin involvement. Twenty-three patients had reticular OLP. Of these, one also had the plaque type, two the atrophic form and one had papular lesions. One patient presented with plaque-type lesions only. The most commonly affected site was the buccal mucosa (20/24, 83 per cent), followed by the gingiva (15/24, 62 per cent), tongue (10/24, 42 per cent) and floor of the mouth (3/24, 12 per cent). Seventeen patients (71 per cent) exhibited OLP lesions in more than one site. Concurrent systemic medications were not reported in any of the patients under review.

The duration of the condition prior to presentation varied, ranging from one month to 10 years. The most common symptom was described as a burning sensation, generally exacerbated by spicy or acidic foods, commercial mouthwashes or toothpaste. The degree of discomfort varied, with some patients reporting only mild irritation and others reporting severe pain.

All patients were treated during the review period with topical steroids. An ointment containing 0.05 per cent betamethasone was applied generously onto cloth strips and placed in contact with the affected mucosa. The patients were instructed to keep the cloth in place (with one end protruding from the mouth) for periods of 20

to 30 minutes. The treatment schedule initially consisted of three applications a day, followed by a gradual tapering off to one application daily over a three-week period. Exacerbations were treated with the same treatment regime. Kenalog in Orabase was used for the treatment of gingival lesions. Patients were instructed to lubricate their finger with petroleum jelly and apply the ointment with their finger tip to the affected gingivae, squeezing the ointment into the embrasures between the teeth at the dento-gingival junction. This treatment was repeated three times a day for 10 days, and then gradually reduced to nightly use only.

In the treated group, 14/24 (58 per cent) patients showed improvement after one month of treatment. However, 8/24 (33 per cent) showed no change and the condition of two patients (eight per cent) worsened. The symptoms of patients who experienced either no improvement or a worsening of their condition were controlled or improved using a repetition of the treatment protocol. By six months, the symptoms of OLP were controlled or improved in 16 patients (66 per cent) and unchanged in three (13 per cent) patients. In five patients (21 per cent), the symptoms had worsened. At one year, symptoms had either been improved or controlled in 23 of 24 (96 per cent) of the treated patients, and no further treatment was required. Only one patient had persistently symptomatic lesions at one year.

The nine patients who remained asymptomatic throughout the review period, and were not treated, included seven women and two men. Although the demographic details of this group were similar to the treatment group, only four of the nine patients were over 50 years of age. Multiple lesions were also a feature of this group, with six of the nine patients having more than one affected site at presentation. The most common form of the disease in this group was the reticulated pattern, which was identified in seven of the nine patients. Two of these seven patients had multiple forms of the disease consisting of plaque type lesions, while the remaining two patients had papular or plaque type lesions only.

Discussion

A wide range of therapeutic agents has been used for the treatment of oral lichen planus, including corticosteroids,[17] retinoids,[18] antimycotics,[14] azathioprine[11] and cyclosporin.[15] The efficacy of these treatment modalities varies, however. In light of the uncertain etiology of oral lichen planus, corticosteroids are still the mainstay of treatment for this inflammatory mucocutaneous disorder.

A variety of delivery methods for corticosteroids have been suggested in the treatment of oral lichen planus. The most common method involves their topical application onto affected sites.[2] In contrast to cutaneous lichen planus, where an occlusive dressing provides efficacious delivery of steroids to lesional tissues, application to oral mucosa is more problematic. Most authors use topical steroids in either an adhesive paste or in suspension as a mouthrinse.[2,11,17,19-21] Although reports clearly demonstrate control of lichen planus using these methods, the response rates vary. Furthermore, the difficulties of treating oral ulceration are not reported, and the contact time of the steroid-containing preparation with the oral lesions has not been studied.

At this institution, we routinely apply topical steroids to inflammatory mucosal lesions using cloth strips. This method offers the advantage of delivering steroids directly onto affected sites for a prolonged time, and avoids the potential complication of adrenal suppression, which is associated with systemic steroid use.[22] The principal disadvantage of this method is its technical difficulty, but with adequate instruction it is quickly mastered by all patients. The use of steroid preparations in an adhesive base (Kenalog in Orabase) is reserved for the treatment of gingival lesions where the paste can be successfully attached to the teeth and the medication absorbed by the adjacent gingiva.

In the group of patients treated with topical steroids in this study, control or improvement of symptoms occurred in 23 of 24 patients. One year after commencement of treatment, symptoms persisted in only one patient, and this was thought to be related to poor patient compliance. This rate of control is higher than other series employing topical therapy,[4,23] but comparable to the results achieved when topical treatment is supplemented by systemic steroids.[2] Unlike its cutaneous counterpart, OLP follows a chronic pattern of remissions and exacerbations, making it difficult to control effectively. The aim of therapy is not to cure the patient of the condition, but to control the symptoms and reduce the duration of symptomatic disease. The therapy described here is effective at achieving this aim using direct application of topical steroids to symptomatic lesions during periods of exacerbations. Furthermore, treatment time is often reduced considerably if the patient institutes therapy quickly after the development of new symptoms.

Differing forms of oral lichen planus are associated with variations in the prevalence and severity of symptoms. Reticulated lichen planus, although the most common form of the disease, is also the most often asymptomatic form. By contrast, ulcerated lesions are more commonly symptomatic and require treatment. In this series, all but one patient with symptomatic lesions had the reticulated pattern and two patients also had the atrophic form. In the asymptomatic group, 80 per cent of patients had reticulated lichen planus, but none the atrophic form of the disease. However, these data are not an accurate reflection of which form of the disease tends to be symptomatic, since there is a referral bias to tertiary care institutions for symptomatic disease.

Some authors recommend the use of anti-fungal medications to supplement steroid therapy in the treatment of oral lichen planus.[11] Although specific tests for fungi were not undertaken in this series, no patient showed clinical evidence of fungal infestation. Fur-

thermore, at the end of the review period, there was similarly no clinical evidence of fungal infection in any of the treated patients. Although some authors suggest that microbiological smears should be performed in all cases of symptomatic lichen planus,[2] this is not routinely done at this institution. We reserve microbiological testing for those cases where mycotic infection is suspected clinically, and we institute local antifungal medication only where there is definite microbiological evidence of infection. In view of the control achieved in 23 of 24 patients with symptomatic oral lichen planus using steroid therapy alone, the rationale for this strategy would appear to be supported.

In conclusion, this study has retrospectively analyzed the course of a group of 24 patients with symptomatic oral lichen planus that was treated with topical steroids using a novel delivery method. Control of the disease was achieved in almost all cases, with only one instance where the disease was not controlled using this treatment regime. ■

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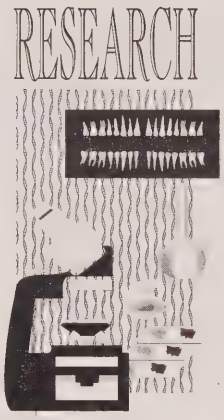

Risk Assessment in Dentistry: Health Risks of Dental Amalgam Revisited

Bernard C.K. Choi, B.Sc., M.Sc., PhD

ABSTRACT

This paper reviews the basic methodology of risk assessment and describes the four steps involved, namely hazard identification, hazard evaluation, exposure evaluation, and risk estimation. The risk posed by the release of mercury vapor from dental amalgam restorations is used as an example to demonstrate the advantages and limitations of this process.

Key words: *risk assessment, toxicology, epidemiology, dental amalgam, dentistry.*

SOMMAIRE

Dans cet article, on révise la méthodologie de base servant à évaluer les risques en dentisterie et on en explique les quatre points, à savoir déterminer s'il y a danger, évaluer ce danger, évaluer le taux d'exposition et estimer les risques. Pour démontrer les avantages et les limites de cette méthode, on prend comme exemple les risques posés par les vapeurs de mercure émanant des restaurations dentaires à l'amalgame.

Mots clés: *évaluation des risques, toxicologie, épidémiologie, amalgame dentaire, dentisterie.*

Introduction

Like technology assessment,[1] risk assessment is a well-established process in medicine, but only in its infancy in dentistry. Risk assessment is a methodologic approach in which the risks of an exposure are identified, characterized and analyzed for dose-response relationships. Once this process is complete, a mathematical model is applied to the collected data to generate a numerical estimate that can serve as a guide to allowable exposures.[2] A recent conference on risk assessment in dentistry stressed the need to identify risk factors for dental diseases, develop risk and disease indicators, and select appropriate statistical risk models.[3]

As new technologies are developed in dentistry, technology assessment will become an increasingly important issue. In turn, because technology assessment involves estimating expected harm,[1] risk assessment will also come to play a key role.

Risk assessment results are vital in the development and implementation of risk management strategies. This process involves applying risk assessment to existing or proposed conditions in society for the purpose of conducting a risk-benefit analysis. In effect, the risk factors and expected harm from exposures to toxic substances, etc., are balanced against the need for products, devices and processes that may be inherently hazardous.[2]

The purpose of this paper is to describe the risk assessment process, explain how the risks of exposure to various substances can be assessed, and point out the advantages and limitations of risk assessment, using Richardson's recent report, "Assessment of Mercury Exposure and Risks From Dental Amalgam,[4]" as an example.

Risk Assessment

There are four steps in risk assessment: hazard identification, hazard evaluation, exposure evaluation, and risk estimation.[2]

Hazard identification is the identification of potentially hazardous substances, devices, or processes. This may involve obtaining complete lists of both the raw materials used and the products and by-products generated in the manufacturing process, sampling and chemical analysis of the hazardous environment, and a thorough survey of the situation to identify all potentially hazardous substances. A review of the literature is often carried out to determine the potential for humans to experience adverse health effects as a result of exposure to the substances, devices, or processes. The literature search for available toxicologic information is usually carried out using a computer, primarily through data systems like Dialogue (chemical data), Medline (biomedical data), and Toxline (toxicological data).[5] This step allows potentially adverse human health effects to be identified for possible further consideration.

Hazard evaluation is the determination of dose-response relationships, potency, toxicity in different animal species (species variation), mechanisms of toxicity,

dosages tested, validation of the test, and relevance to human extrapolation. This may involve conducting an analytical review of data to determine their validity and their suitability for modelling, as well as which dose-response curves should be used.

Exposure evaluation is the quantification of expected human exposures. This involves estimating the levels of exposures from various routes of entry.

Lastly, risk estimation is the mathematical modelling of animal and/or human toxicity data, in combination with human exposure evaluations, to estimate the probability of human health effects and recommend an exposure guideline.

Basic Concepts In Risk Assessment

A basic concept in risk assessment was described by Paracelsus (1493-1541): "All substances are poisons; there is none which is not a poison. The right dose differentiates a poison and a remedy."[6]

In other words, as the dose increases, a substance may first become effective, then toxic, and finally lethal. Effective dose (ED) is the dose causing a desirable effect; toxic dose (TD) is the dose causing an undesirable toxic effect (non-lethal); and lethal dose (LD) is the dose causing death.

Since the percentage response (or percentage of subjects in a population who respond to a specific dose of a specific substance) is always normally distributed in a population, a dose-response curve (a plot of percentage response versus dose) is S-shaped, or sigmoid. This is the shape of a cumulative normal curve.

As dose increases, three sigmoid dose-response curves will become apparent: ED, then TD, and finally LD. Also, because of the variations in the percentage response by the organisms, different doses can be defined. For example, TD_{10} is the dose toxic to 10 per cent of the test organisms, while LD_{50} is the dose lethal to 50 per cent of the test organisms.

The most important concept in the derivation of a safe exposure guideline is the threshold dose (ThD), which is the minimal dose that is effective in prompting an "all-or-none" effect. For non-carcinogenic substances, a threshold dose is thought to exist below which no toxic effect would be observed. This threshold dose is also called "Suggested No Adverse Response Level" (SNARL) by the U.S. National Research Council of the National Academy of Sciences, and "No Observable Effect Level" (NOEL) by the U.S. Environmental Protection Agency. When it is difficult to determine the threshold or no effect dose, a lowest observable effect level (LOEL) may sometimes be determined instead. For carcinogenic substances, mathematical models based on no threshold are used.

To calculate a safe human dose (SHD) or tolerable daily intake (TDI), which is the allowable human exposure limit, the threshold dose is adjusted by the body weight and divided by a safety factor (SF).

$$\text{SHD (mg/day)} = \frac{\text{ThD (mg/kg/day) X body weight (kg)}}{\text{SF}}$$

Body weight is used to extrapolate the threshold dose results to human populations, based on the size differential between humans and the test species. The SF is a factor that allows for the uncertainties inherent in the process of extrapolating data about toxic exposures from one population to another (intraspecies and interspecies variations), and ranges from 10 to 1,000 depending on the availability and reliability of animal or human data.[2] A guideline for selecting SF is shown in **Table I**. Basically, 10 is used when human data are available, 100 is used when extrapolation from animal to human is required, and 1,000 is used when there are scanty data. An additional SF of 10 is required when the lowest observable effect level is used rather than a true threshold dose.

Health Risks Of Dental Amalgam: An Example Of Advantages and Limitations Of Risk Assessment

Dental amalgam has been used for more than 150 years, with no apparent epidemic of health problems. Amalgam restorations are durable, easy to place and relatively inexpensive.[7] However, there has been considerable debate and controversy on the safety of dental amalgam, due to its mercury (Hg) content. Current formulations of dental amalgam contain about 50 per cent mercury by weight.

The health hazards of high levels of mercury exposure are well-known.[8-12] They include neurotoxicity (such as peripheral and central nervous system effects, hand tremor, mood changes, depression, anxiety, confusion, and fatigue), nephrotoxicity (such as nephrotic syndrome, and renal damage), and immunotoxicity (such as dermal sensitivity, and contact dermatitis). There have also been reports of illnesses associated with dental amalgam.[13-17]

In a recent Health Canada report, Richardson[4] conducted a formal risk assessment of mercury exposure from dental amalgam. The report, which included a literature review, described and summarized the use of mercury in dental amalgam, the dental health status of Canadians, and the toxic effects of mercury. It also estimated, based on the Nutrition Canada Survey, that the mean number of filled teeth in Canadians is: 0.17 fillings in toddlers (aged three to four years), 1.69 fillings in children (aged five to 11 years), 3.59 fillings in teens (aged 12 to 19 years), 4.57 fillings in adults (aged 20 to 59 years), and 1.25 fillings in seniors (aged 60 years or over). It then estimated, based on two independent models,[18,19] that the mercury exposure of Canadians from dental amalgam restorations is: 0.8 to 1.4 µg Hg/day in toddlers, 1.1 to 1.7 µg Hg/day in children, 1.9 to 2.5 µg Hg/day in teens, 3.4 to 3.7 µg Hg/day in adults, and 2.1 to 2.8 µg Hg/day in seniors. Furthermore, based on an industrial hygiene study by Fawer et al,[20] the Richardson report estimated that the tolerable daily intake (TDI) for mercury is 0.014 µg Hg/kg body weight/day. In turn, it estimated the number of amalgam-filled teeth that will result in a mercury intake that is less than or equivalent to the proposed TDI. Two models were presented. In one, Richardson suggests that one fill-

Table I

U.S. National Academy Of Sciences Safe Drinking Water Committee Guideline For Selecting Safety Factor (SF)[2]

Safety Factor	Condition
10	Valid human data based on chronic exposure are available.
100	Human data are inconclusive, limited to acute exposure histories, or absent, but long-term, reliable animal data are available for several species.
1,000	No long-term or acute human data are available and the experimental animal data are scanty.
Additional 10	LOEL is used rather than a true ThD.

ing is permissible in toddlers, one in children, three in teens, four in adults, and four in seniors.

Richardson's 109-page report[4] is the first comprehensive risk assessment in Canada of mercury exposure from dental amalgam. It is also the first report to provide a systematic and formal risk analysis of mercury exposure from dental amalgam, and the first to suggest a simple and practicable guideline for the placement of amalgam fillings in various age groups in Canada. This kind of scientific approach is welcome in dentistry. However, given the enormous public health and cost consequences that would ensue if the recommendations and implications of the report are accepted by Health Canada, the limitations of the risk assessment process used by Richardson[4] must be given careful consideration and be fully recognized.

1. Lack of a panel of experts

An assessment of public exposure to a widely-used substance such as dental amalgam would normally be carried out by a panel of experts with a balanced mix of backgrounds, opinion and expertise. However, the Richardson report[4] was prepared by just one author, which may have caused biases in both the selection of literature and the estimation process.[21]

2. Lack of extensive literature review and meta-analysis

There is a great wealth of published material on the health risks of mercury exposure. Nevertheless, the Richardson report admitted that its literature review was "not exhaustive." A report on a public health issue as important as dental amalgam safety should be based on a complete review of all literature, published and unpublished. Meta-analysis also would be preferred, which would require the studies identified in this thorough literature review to be rated by a panel of experts. Statistical methodologies would then be applied to systematically combine the studies to estimate the overall summary effect. Guidelines are available, for clinical research purposes, on using meta-analysis to assess the overall effects of exposures to substances based on various different studies.[22]

3. Problems in accuracy and precision of exposure assessment calculations

The accuracy and precision of the overall estimates of mercury exposure used in the Richardson report have not been adequately addressed. In addition, the equations used to calculate the overall exposure to mercury doses were based on indirect methods that involved a series of summation and product terms, such as release rate and absorption factor, etc. The accuracy and precision of the report's estimate of overall mercury dose from dental amalgam is therefore dependent on the accuracy and precision of the estimates for the individual terms in the equations.

There are problems in the accuracy and precision of the estimates for the individual parameters. For example, the estimate for release rate, based on a study by Skare and Engqvist[23] that involved only 42 adult subjects, was 0.73 µg/day-surface, with a large standard deviation of 0.30 µg/day-surface. Other estimates also have very high variations, e.g. the inhalation absorption factor ranges from 61 to 86 per cent, while the ingestion absorption factor ranges from five to 15 per cent.

The number of amalgam surfaces per filling was estimated from a study by Nylander et al[24] that involved only 25 subjects. The mean number of surfaces per filling in this small group was 1.65, again with a large standard deviation of 0.62.

The strength of a chain is determined by its weakest link. Since one or more of the individual parameter estimates used in the Richardson report were inaccurate or imprecise, the accuracy and precision of the overall estimate of mercury exposure could be affected. Problems with indirect methods of estimating exogenous and endogenous exposures have already been described.[25]

4. Problems with tolerable daily intake

The tolerable daily intake of mercury from dental amalgam was derived from an occupational study by Fawer et al.[20] This is a relatively small study, which was based on the experience of only 51 workers. Of these workers, 26 had been exposed to metallic mercury vapor, and 25 acted as non-exposed controls. This study may have been subject to selection bias,[21] since the workers were from a convenient sample: seven were glass blowers in fluorescent tube factories, 12 worked in a chloralkali plant, and seven were in the acetaldehyde production industry. Their occupational exposure to mercury was not representative of the overall industrial experience. Further, the Fawer et al study considered only male workers and did not include female workers. It only related the occurrence of hand tremor to the mercury concentrations in the air at the time of the study. It did not ascertain the subjects' work history and past exposure to mercury, and it did not ascertain the number of amalgam-filled teeth in each subject. The study also failed to measure for industrial exposures to substances other than mercury that

could have contributed to hand tremors in the study population.

There are a number of problems in extrapolating the results of an occupational study such as Fawer et al's[20] to the general population, as was done in the Richardson report. In particular, there is a healthy worker effect.[26] This occurs because workers are normally healthier than the general population, which includes individuals who are either not selected for employment or unable to maintain employment because of poor health, and those who are disabled, old, or retired. Due to these differences in health status, the effects of mercury exposure in workers may not be the same as in the general population.

The study by Fawer et al[20] was based on male workers with a mean age of 44 years. Results may not be generalized, as was done in the Richardson report, to females or to groups outside of the normal working age, such as toddlers, children, teenagers, or seniors.

In addition, the study by Fawer et al[20] was not originally designed to investigate the dose-response of mercury concentration in air with the incidence of hand tremor. It therefore should not have been used to set exposure standards.

The study by Fawer et al[20] simply selected two convenient groups of workers — one with mercury exposure, the other without — compared the hand tremor experience of the two groups, and found a statistically significant difference. The study then found that the personal exposure (time weighted average, TWA) to mercury for the group of workers with mercury exposure was 0.026 mg/m^3. This mercury concentration of 0.026 mg/m^3 was the observed industrial exposure of 26 male workers in several fluorescent tube factories, one chloralkali plant, and one acetaldehyde production industry, in a particular day. Had another group of workers been used in the study, another average mercury exposure would undoubtedly have been obtained.

5. Problems with tolerable urine concentration

Tolerable urine concentration in the report was derived from one small study by Echeverria et al.[27] This study involved only 39 subjects, including 19 dentists with high urine mercury and 20 dentists with low urine mercury. The tolerable concentration was estimated to be 0.7 µg/L, which was then applied to the data of Skerfving,[28] based on the assumption that µg/L was equivalent to µg/g creatinine. This urine mercury concentration was found to correspond to about five fillings. However, most of the data points in the study of Skerfving[28] represented a number of fillings from 10 to 25, and urine mercury concentrations from 1.0 to 10.0 µg/g. Therefore, the derivation of five fillings from 0.7 µg/g was outside the normal range of the graph, and may be in error.

Discussion

Risk assessment is an important process for the derivation of safe human dose. It is a method that can be used to generate a numerical estimate to serve as a guide to allowable exposures. The method is considered to be reasonably objective and accurate when reasonably good human dose-response data are available.

There are, however, several limitations to risk assessment. First, the derivation of safe human dose (SHD) is based on a number of assumptions. When the assumptions are violated, the SHD estimates could be inaccurate. For example, the basic equation for SHD assumes that there is a threshold dose, that extrapolation can be made based on body weight differentials, and that the use of safety factor (SF) can adequately allow for the reliability of the data used for extrapolation. Since these assumptions may not hold true, more complex equations are available for deriving SHD — those that also account for absorption factor (ratio of animal absorption to human absorption), ratio of exposure regimens (ratio of dosage regimen in test animals to exposure regimen in humans), and ratio of elimination (ratio of half-life in animal to half-life in humans), for example.[2] Again if one or more of these assumptions are wrong, there will be problems in the accuracy in the estimate of SHD.

Second, the greater the number of assumptions that are made, the greater the number of terms that must be included in the equation for SHD. This may lead to problems in the overall accuracy, as well as variance, in the estimate for SHD.

Third, there are problems with intra- and inter-species variations. Factors that may influence risk interpolations and extrapolations include: route of entry (inhalation, ingestion, skin absorption), sex, age, genetic make up, multiple exposures, hormonal status, disease states, diet, environment, and circadian rhythms. Risk studies based on subgroups of the population may not be readily generalizable to other subgroups.

The question of mercury exposure and risks from dental amalgam is an important public health problem. Therefore, utmost care must be used to ensure that risk assessment results are relatively free of error, neither minimized nor exaggerated, and based on the most accurate data sources and methodology currently available. Any estimation errors causing false positive or false negative decisions would be costly to society. Thus, a panel of experts with a balanced mix of expertise is needed, together with a properly conducted formal and comprehensive meta-analysis of the pertinent literature.

The report by Richardson[4] represents a first attempt in Canada to estimate systematically the risks from dental amalgam, and to define practicable guidelines for the number of fillings in various age groups. As these guidelines were based on indirect methods, there are some unavoidable problems, assumptions, omissions, and errors in the approach used. Therefore, further evidence will be needed to investigate more fully the health risks of mercury exposure from dental amalgam in the general population in Canada. ■

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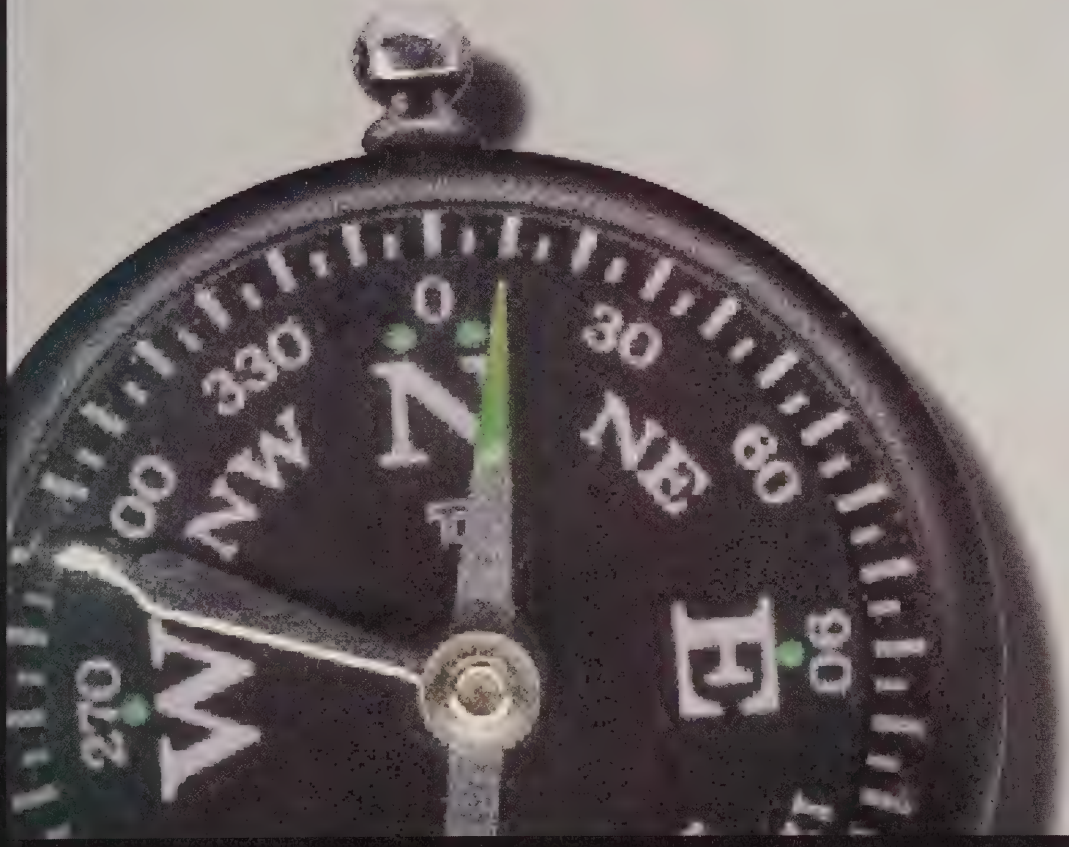

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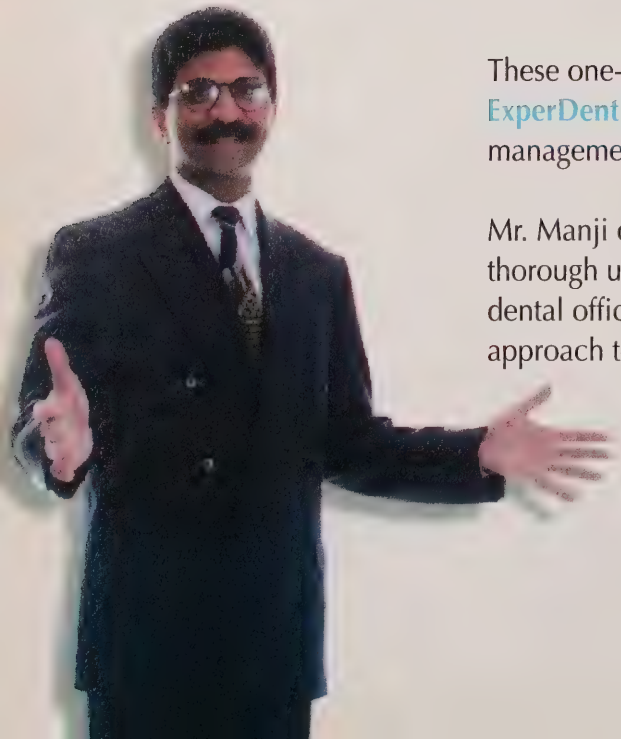

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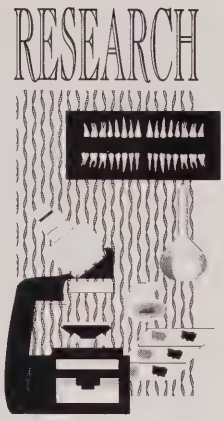

Ontario Dentists' Knowledge and Beliefs About Selected Aspects of Diagnosis, Prevention and Restorative Dentistry

D.W. Lewis, DDS, DDPH, M.Sc.D., FRCD(C)

P.A. Main, BDS, DDS, DDPH, M.Sc., FRCD(C)

ABSTRACT

Based on the responses of 1,276 general dental practitioners in Ontario to a mail questionnaire, variations in certain aspects of the dentists' diagnostic, preventive and restorative knowledge and beliefs are examined. Despite recent practice recommendations and guidelines indicating that patient need and service selectivity, rather than traditional, routine prescriptions, should be the guiding principle of practice, many dentists seem to follow tradition in defining optimal intervals for dental examinations and prophylaxes, bitewing radiographs and topical fluoride applications.

Although the respondents' knowledge and beliefs were correct and consistent with current evidence in many areas, some large deficiencies were identified. These include: a lack of awareness that professional prophylaxis prior to topical fluoride application is usually unnecessary and that sealant applications to certain teeth are not cost-effective; an over-estimation of the speed at which dental caries progress through the enamel; and, despite good knowledge about the opportunities for the remineralization of enamel lesions with fluorides, a tendency to restore enamel caries. In some instances, practitioner beliefs were shown to influence practice. For example, dentists who knew about the slow progression of approximal surface caries also reported more often that bitewing intervals should be longer, and that the placement of a restoration should be delayed until the caries penetrates the dentin. Similarly, correct knowledge about sealant effectiveness was positively associated with high sealant use.

If dentists are to be expected to understand and follow emerging diagnostic, preventive and restorative practice recommendations and guidelines, continuing education is required to correct and update some of their knowledge and beliefs, as displayed in the responses to this questionnaire.

SOMMAIRE

En Ontario, on a posté un questionnaire auquel 1276 dentistes généralistes ont répondu afin d'étudier certains points touchant leurs connaissances et leurs opinions sur leurs diagnostics, leurs soins de prévention et leurs soins de restauration. Malgré les recommandations et les directives données récemment aux dentistes et stipulant que les besoins des patients et le choix qu'ils font des services qu'on leur offre doivent servir de lignes de conduite au lieu des ordonnances traditionnelles et ordinaires, de nombreux praticiens semblent se conformer à la tradition pour déterminer la meilleure fréquence des visites pour les examens dentaires, les soins prophylactiques, les radiographies «bitewing» et les applications topiques de fluorure.

Bien que les connaissances et les opinions des répondants fussent correctes et conformes aux témoignages actuels dans plusieurs domaines, on a relevé de grandes lacunes dont: l'ignorance que les soins prophylactiques professionnels sont ordinairement inutiles avant une application topique de fluorure; une surestimation de la vitesse à laquelle les caries rongent l'émail; et, malgré une bonne connaissance des occasions pour reminéraliser les lésions de l'émail à l'aide de fluorures, une tendance à restaurer les caries de l'émail. Ainsi, les dentistes qui savent que les caries des faces proximales se développent lentement ont déclaré plus souvent que les intervalles entre les radiographies «bitewing» doivent être plus longs et que la pose d'un matériau de restauration doit être reportée jusqu'à ce que les caries attaquent la dentine. De même, les bonnes connaissances touchant l'efficacité des matériaux de scellement étaient résolument liées à un grand usage de ces matériaux.

Comme l'ont démontré les réponses au questionnaire, si l'on veut que les dentistes comprennent et suivent les recommandations et les directives nouvelles touchant le diagnostic, les soins de prévention et les soins de restauration, des cours de perfectionnement s'imposent pour corriger et mettre à jour une partie de leurs connaissances et de leurs opinions.

Table I

Dentists' Opinions About Optimal Time Intervals Between Dental Examinations and Recall Bitewing Radiographs for Average Patients

		Dental Examination Intervals* (months)				
Patient Age (years)	Mean (months)	4	6	≥ 12	Non-specific	Total per cent
3-5	7.1	2%	80%	17%	2%	101
6-12	6.3	5%	90%	4%	1%	100
13-18	6.5	3%	88%	7%	2%	100
31-44	7.5	6%	67%	21%	6%	100
≥ 65	7.5	11%	60%	22%	6%	99

		Bitewing Radiograph Intervals* (months)					
Patient (dentition)	Mean** (months)	6	12	18	≥ 24	Non-specific	Total per cent
Child (primary)	14.9	10%	50%	14%	17%	10%	101
Adolescent (permanent)	17.1	5%	42%	20%	28%	5%	100
Adult (permanent)	20.3	2%	27%	18%	46%	7%	100

** For the distribution of intervals n=1,249 to 1,263 and for the means n=1,169 to 1,245 dentists. Some respondents stated intervals within a month or two of the tabulated intervals. For the radiographs, patients are defined as regular patients of several years with no symptoms or caries in the past two to three years.*

*** For high caries risk patients, these means were: 8.3, 9.0 and 10.1 months, respectively.*

Introduction

As with physicians,[1] large variations in the knowledge and clinical practices of dentists have been reported.[2,3] This has been particularly evident in diagnostic treatment planning and restorative decisions, and in the use of fissure sealants.[3-6] Although research findings have not always been consistent, these variations are partly explained by the sociodemographic characteristics of dentists, as well as by dental practice and patient factors. These include the age, school of graduation, amount of continuing education, and level of professional reading of the dentist; the regional location, busyness, staff employment and organization of the dental practice; and the personal characteristics, oral status, demands, regularity of attendance and source of dental care payment of the patient.[6-10]

Not surprisingly, a quick perusal of the recent literature revealed large variations, of many kinds and consequences, in the knowledge and treatment practises of Canadian dentists. These included variations in: the formula of the local anesthetic used, as well as in the concentration of epinephrine;[11] knowledge about infectious diseases and infection control practices;[12] the tendency to refer patients to pediatric dentists;[13] and beliefs about radiology and the prescription and use of radiographs for similarly-described patients.[14] Large variations in restorative decisions, including the choice of restorative material and type of cavity preparation, for apparently similar patients, have also been reported.[8] Similarly, large differences have been seen between practitioners in the perception of caries depth and need for restoration, even when the same approximal tooth surfaces on the same bitewing radiographs are examined by a number of dentists.[15]

Recent discoveries about the epidemiology of dental disease, as well as new research findings, are changing the face of dentistry. It is important, therefore, to document current beliefs about diagnosis, prevention and restorative dentistry, since such beliefs presumably influence dental practise in these areas.

For example, the increased relative importance of fissure caries and the slower caries progression associated with the overall decline in caries are now well established,[16] as are the emphasis on remineralization rather than restoration of early carious lesions,[8,17] concern about the effectiveness of routine dental prophylaxis before topical fluoride applications,[18] and, for healthy adults,[19] new fluoride guidelines[20,21] and radiologic guidelines that encourage the prescription of radiographs according to patient need rather than at administratively fixed intervals.[14]

The purpose of this paper is to describe the knowledge and beliefs reported in a survey of general dental practitioners in Ontario about selected aspects of dental diagnosis and preventive and restorative dentistry, as well as the inter-relationships between some of these beliefs.

Table II

Dentists' Opinions About Optimal Time Intervals Between Prophylaxis Visits and Topical Fluoride Visits for Average Patients

		Prophylaxis Intervals* (months)				
Patient Age (years)	Mean (months)	4	6	≥ 12	Non-specific	Total per cent
3-5	7.2	3%	74%	19%	4%	100
6-12	6.4	5%	84%	7%	4%	100
13-18	6.4	5%	85%	7%	4%	101
31-44	6.7	12%	67%	13%	8%	100
≥ 65	6.5	22%	56%	13%	9%	100

		Topical Fluoride Intervals* (months)				
Patient Age (years)	Mean (months)	4	6	≥ 12	Non-specific	Total per cent
3-5	6.7	6%	75%	12%	6%	99
6-12	6.3	8%	81%	7%	5%	101
13-18	6.8	4%	73%	13%	9%	99

** For the distribution of intervals n=1,151 to 1,276 and for means n=1,044 to 1,206 dentists. Some respondents stated intervals within a month or two of the tabulated intervals.*

In a previous analysis of this survey, we showed that certain restorative practices were significantly associated with the dentist's age and school of dental graduation.[8] We do not intend to examine the impact of these personal characteristics here. Rather, for this large group of Ontario dentists, who represent a wide dispersion of age, geography and prior dental school affiliation, we will examine the extent of the variation in their knowledge and beliefs about: optimal dental examination, bitewing radiographs, dental prophylaxis and topical fluoride application intervals; the effectiveness of topical fluorides and sealants; the speed of carious lesion progress; and restorative treatment thresholds relative to caries depth. We will then examine a number of the relationships between these knowledge and belief variables, including knowledge about topical fluoride effectiveness and beliefs about prophylaxis intervals and topical fluoride intervals; beliefs about the speed of lesion progress and bitewing radiograph intervals on the one hand, and dentists' stated restorative thresholds on the other; and knowledge about sealant effectiveness relative to sealant use.

Methods and Survey Response

Using the Royal College of Dental Surgeons of Ontario's (RCDS) May 1992 list of licensed dentists, in June 1992 a mail questionnaire was sent to a randomly-selected group that included one-half of all general dental practitioners in Ontario. Details of the survey methodology and its response have been previously described.[8]

The questionnaire concerned the dentists' knowledge, beliefs and practices in diagnosis, radiology, and preventive and restorative dentistry, as well as demographic and practice factors that may influence clinical decision-making. Survey questions were developed by reviewing the literature and through consultation. They were then pre-tested on a group of 28 dentists and revised accordingly.

The data contained in the returned questionnaires were edited for completeness, coded and entered for analysis using Epi-Info(V3.1). Data were subsequently analyzed using the SPSS/PC+ statistical package.

Using the previously described knowledge and belief variables, means, frequency distributions and cross-tabulations were completed, and chi-square measures of association were calculated. For the sealant analysis, ANOVA and multiple regression were used.

After three mailings, 52 per cent of the eligible dentists had responded to this long and detailed questionnaire, which included several complex patient descriptions. The 1,276 respondents represented all geographic regions and age groups of dentists in Ontario. Although the response rate exceeded the 43 per cent that Hovland et al[22] suggested may be high enough to obtain valid data in surveys of dentists, we cannot comfortably state that our findings can be generalized to all dentists in general practice in Ontario. Nevertheless, since the responses represent the views of nearly 1,300 Ontario dentists relative to a number of important beliefs, they have important intrinsic value.

Findings

Variations In Knowledge and Beliefs

Table I presents the varying beliefs of the responding dentists with respect to the optimal time intervals between dental examinations and bitewing radiographs for

Table III

Dentists' Beliefs About Dental Caries Prevention — Topical Fluorides

	Re: Topical Fluoride Applications (TFA)		
	TFA Protect All Surfaces Equally (per cent)	With TFA, Incipient Enamel Caries Can Be Cured (per cent)	For Maximum Caries Prevention in Average Patient, a Prior Prophylaxis is Essential (per cent)
Strongly agree	1	15	38
Agree	13	63	44
Disagree	55	15	13
Strongly disagree	27	1	3
Don't know	4	6	2
TOTAL (per cent)	**100**	**100**	**100**
n	**1,260**	**1,251**	**1,265**

Note: The percentage corresponding to the most correct answers are underlined.

average patients. The mean optimal interval for dental examinations was 6.3 months for six- to 12-year-old patients and 7.5 months for adults. Most dentists (60 to 90 per cent) believed that six months was the optimal examination interval for all age groups. From two to 11 per cent of dentists chose four months, while four to 22 per cent chose a much longer period of 12 months. A small number of dentists (one to six per cent) preferred no specific interval, which can be construed as letting patient needs be the guiding principle. The intervals are age-related, since nearly 90 per cent of dentists preferred a six-month interval for children six to 18 years of age and far fewer dentists (60 to 67 per cent) preferred a six-month interval for adults. Some dentists (six to 11 per cent) considered four months as optimal for adults, while about 21 per cent considered 12 months as optimal. Both of these intervals were much less popular for children six to 18 years of age.

For bitewing radiograph recalls in low risk patients, most dentists recommended a 12-month interval for the two younger age groups, and at least 24 months for dentate adults (**Table I**). For young children and adolescents, just as many dentists, 10 per cent and five per cent respectively, recommended a six-month interval as recommended no specific interval. There is also a definite age relationship in these recommendations. This is readily seen with the mean recommended intervals, which rise from 15 to 17 to 20 months as age increases. It is worth noting that for patients of similar age who are at high risk, these means are about one-half as large (**Table I****).

The optimal average time intervals for regular patients of varying ages to receive dental prophylaxis and topical fluoride treatments, as reported by the respondents, are presented in **Table II**. For both of these separate services — professional dental prophylaxis and topical fluoride applications — the favored interval was six months at all ages (73 to 81 per cent for topical fluoride, and 56 to 85 per cent for prophylaxis). A small proportion of the dentists (about five per cent) recommended four month intervals, and about 10 per cent, on average, suggested intervals of 12 months or longer for children and teenagers. However, more

Table IV

Dentists' Beliefs About Dental Caries Prevention — Fissure Sealants

	Proven Effective (per cent)	Will Lead to Further Caries if Seal Small Fissure Lesions (per cent)	Are Cost Effective in:		
			Primary Molars (per cent)	Pre-Molars (per cent)	Permanent Molars (per cent)
Strongly agree	42	2	13	26	53
Agree	48	15	27	42	38
Disagree	7	50	36	19	5
Strongly disagree	—	28	13	4	1
Don't know	4	5	11	8	3
TOTAL (per cent)	**101**	100	**100**	**99**	**100**
n	**1,261**	1,255	**1,104**	**1,194**	**1,256**

Note: The percentage corresponding to the most correct answers are underlined.

Table V

Dentists' Opinions About Average Time for Posterior Approximal Surface Dental Caries to Progress from Outer Enamel Surface to Dentinoenamel Junction

Length of Time	Primary Tooth (per cent)	Permanent Tooth (per cent)
< 6 months	26	3
6-11 months	57	24
12-23 months	15	55
> 23 months	2	19
TOTAL (per cent)	**100**	**101**
n	**1,232**	**1,218**

Note: The percentages corresponding to the most correct answers are underlined.

dentists (12 to 22 per cent) recommended a prophylaxis interval of just four months for adults.

For all age groups, the mean number of months, or intervals, between visits for both of these services was between 6.3 and 7.2 months. Four to nine per cent of the dentists did not recommend a specific interval, since they preferred to customize the frequency of these two different preventive services according to patient needs.

Responses identifying the dentists' knowledge with respect to the effectiveness of topical fluoride and fissure sealant applications for preventing dental caries are found in **Tables III** and **IV**. Regarding topical fluorides (**Table III**), 82 per cent of respondents correctly stated that this preventive method does not provide equal protection to all tooth surfaces and 78 per cent were aware that early enamel caries can remineralize with appropriate fluoride applications.[17] However, only 16 per cent seemed to be aware of the clinical studies showing that a dental prophylaxis prior to the professional application of topical fluorides is clearly not necessary to achieve maximum caries prevention for the average patient.[18]

As the highlighted numbers in **Table IV** show, 90 per cent of dentists correctly stated that fissure sealants, based on many clinical trials, have conclusively demonstrated their effectiveness.[6,9] Most respondents (78 per cent) also recognized, again based on trials, that sealants which are properly placed over small carious fissure lesions will not lead to further decay.[9] Although 91 per cent correctly stated that early fissure sealing of permanent molars is cost-effective, 40 per cent and 68 per cent, respectively, incorrectly believed that early fissure sealing is similarly cost-effective for primary molars and permanent premolars.[23]

Variation was also displayed by respondents when they were asked to indicate, on the basis of their clinical experience, the average speed of progress of approximal caries in posterior teeth from the outer enamel to the dentinoenamel junction (DEJ) (**Table V**). For primary molars, 26 per cent felt this would occur, on average, in less than six months, while 57 per cent believed it would take six to 11 months. Relatively few (15 per cent) got the correct answer — 12 to 23 months, on average.[24] For permanent posterior teeth, although respondents properly recognized that caries progress more slowly than in primary teeth, there was considerable variation in the estimates, and only 19 per cent got the correct answer — more than 23 months, on average.[24]

The minimum depths or thresholds at which the respondents stated that approximal surfaces ought to be restored — according to the caries depth perceived by them when reading the bitewing radiographs of patients of average susceptibility — are shown in **Table VI**. For 12-year-old patients, 60 per cent of dentists would restore enamel caries, while the remainder would wait until the lesion appears to have just penetrated beyond the DEJ. For 30-year-old patients, 28 per cent would restore enamel lesions, while two-thirds would wait until the DEJ has just been penetrated, and five per cent would wait until dentinal extension is evident. For 55-year-old patients, 20 per cent would restore enamel lesions,

Table VI

Minimum Restorative Treatment Thresholds for Posterior Approximal Surface Caries Based on Bitewing Radiographs

Lesion Severity	Age of Patient (years)		
	12 (per cent)	30 (per cent)	55 (per cent)
Confined to outer half of enamel	9	1	1
Extends to inner half of enamel	51	27	19
Extends just through DEJ	40	66	67
Extends to outer half of dentin	—	5	11
Extends to inner half of dentin	—	—	1
TOTAL (per cent)	**100**	**99**	**99**
n	**1,188**	**1,189**	**1,187**

Table VII

Mean Percentages of Sealant Use Among All Dentists for Patients Ages Six to 11 Years by Correctness of Beliefs About Sealants

Sealant Belief	Mean Per Cent Use by Correctness of Belief		
	Wrong (mean per cent)	Right (mean per cent)	ANOVA probability
Effective? (n)	10.8 (87)	52.6 (1,102)	$p < 0.0001$
Will redecay if placed over small lesions (n)	42.7 (207)	50.3 (956)	$p < 0.0030$
Cost-effective for permanent molars (n)	13.0 (70)	52.0 (1,121)	$p < 0.0001$

two-thirds would wait until the DEJ has just been penetrated, and 12 per cent would wait until dentinal extension of the radiolucency is evident.

Interrelationships Among Knowledge and Beliefs

Although variation in the knowledge of respondents, as well as in a number of individual beliefs, has been described, the interrelationships between them has not.

Cross-tabulations between the responses concerning the dentists' knowledge about topical fluoride effectiveness (**Table III**) and beliefs about optimal professional dental prophylaxis intervals and topical fluoride intervals for patients of various ages (**Table II**) showed a mixture of statistically significant results. The only knowledge question that was consistently and significantly related to the intervals recommended by the dentists concerned the need for a dental prophylaxis prior to a topical application. Those dentists who correctly stated that a dental prophylaxis prior to a topical fluoride application does not enhance caries reductions indicated that optimal prophylaxis intervals and topical fluoride intervals for patients of all ages should be longer or more selectively chosen, i.e. more non-specific intervals were selected.

When the dentists' beliefs about the speed of progress of approximal surface caries through the enamel (**Table V**) were compared with their beliefs about bitewing radiograph recall intervals and restorative thresholds, a number of statistically significant relationships emerged. Dentists who (correctly) believed that caries progress through the enamel is slow suggested that the intervals for taking bitewings of regular patients without caries (**Table I**) should be longer than for children with primary and mixed dentitions, or for adolescents with permanent dentitions. But these differences, although significant, were small. For example, for the dentists recommending a six-month bitewing radiograph recall for regular adolescent patients with no clinical sign of caries, just over one-half (55 per cent) believed caries progress through the enamel to be six to 11 months, while just under one-half (48 per cent) believed this caries progress to be greater than 23 months.

With respect to their stated restorative threshold for 12-year-old patients (**Table VI**), 63 per cent of dentists who believe that caries progress through the enamel is six to 11 months reported a restorative threshold in the enamel, whereas 48 per cent of those who believe that caries progress is greater than 23 months had a similar restorative threshold. For 30-year-old patients, this same contrast in dentists' beliefs about caries progress revealed restorative thresholds in the enamel of 32 per cent versus 20 per cent.

To explore whether the "correct" answers to beliefs about sealant effectiveness (**Table IV**) are associated with sealant use, the mean percentage of sealant use reported by dentists for six- to 11-year-old children was analyzed using ANOVA (**Table VII**). The mean percentage of sealant use by dentists in their six- to 11-year-old patients was about 11 to 13 per cent for those dentists who incorrectly stated that sealants were not effective or cost-effective (permanent molars), and about four times higher (52 to 53 per cent) for dentists who were correct.

Although it is not tabulated here, multiple regression revealed that the respondents' knowledge about sealant effectiveness and cost-effectiveness, along with the extent of dental hygienist employment and the amount of continuing education undertaken by the dentists, significantly explained the mean percentage of sealant use for six- to 16-year-old children by all dentists (R^2 = 22 per cent). Since a great variety of other beliefs related to the dental practice and personal characteristics of the responding dentists were evaluated in this multiple regression, but were not significant, the importance of sealant beliefs was reemphasized by this multivariate analysis.

Discussion

Recent practice guidelines and epidemiologic findings suggest that the intervals for dental diagnostic and preventive services should be individually selected according to patient need rather than using the traditional fixed intervals of the past.[14,20,23] Although some variation was evident — exemplified by the small proportion of dentists who chose contrasting intervals of four or 12 months, and by the small proportion who chose non-specific intervals according to need — most dentists still chose

older and more traditional intervals as being optimal for average patients (**Tables I** and **II**).

For dental examinations and prophylaxes in all age groups, and for topical fluorides in children and teenagers, this interval was six months. For bitewing radiographs, the optimal interval selected by about one-half of the dentists was 12 months for children and teenagers, and 24 months or more for adults. For dental examinations, and for prophylaxes and topical fluoride applications, the mean intervals ranged from between 6.3 and 7.5 months for all ages, and for bitewing radiographs, the mean intervals increased with patient age from about 15 to 20 months (**Tables I** and **II**).

For dental examinations and prophylaxes, we found no published historical information to compare with the intervals preferred by the Ontario dentists responding to this survey. However, although the methods of reporting were different, the radiographic intervals reported here were comparable to those gathered early in 1991 for general dentists in Ontario,[14] and the topical fluoride intervals for six to 12 year olds were much shorter than those of the six- and 13-year-old children in a large regional survey conducted in the United States in 1985.[10] In Ontario, 81 per cent of the dentists reported a six-month interval, and seven per cent reported 12 months or longer, while only about 66 per cent of the U.S. dentists reported a six-month interval, and 25 per cent reported a 12-month interval between topical fluoride applications.

About 80 per cent of dentists answered the question regarding the lack of equivalent protection of all types of tooth surfaces, and the potential for remineralization of incipient enamel caries, by topical fluoride (**Table III**). Based on a survey conducted in the early 1980s in the United States, the percentage of dentists correctly answering similar kinds of questions was lower.[25] However, only 16 per cent of the Ontario dentists were aware that maximum caries protection with topical fluoride applications does not require a prior dental prophylaxis, even though a number of clinical studies that proved this were completed many years ago and summarized in 1984.[18] These findings were reemphasized by the 1992 National (Canadian) Workshop on Fluorides[20] and, in 1995, by the RCDS.[21] It would be interesting to learn the extent to which the lack of need for a prior dental prophylaxis is emphasized by Canadian dental schools and, in the present context, by the two dental schools in Ontario. A statistically significant higher percentage of more recent dental graduates correctly answered the question about prior prophylaxis and fluoride's surface protection compared to older graduates, but the differences were slight.

Similar differences favoring more recent graduates were observed for most of the sealant knowledge questions (**Table IV**). Nearly all of the dentists (90 per cent) — younger and older graduates alike — correctly reported that sealants had proven their effectiveness. About 78 per cent of the dentists, a higher percentage than the 68 per cent reported six years ago in the United States,[26] were correctly aware that the further caries risk was slight if small fissure lesions were sealed. Just over nine of 10 respondents were correctly aware that sealants are cost-effective when applied to molar teeth. However, only 49 per cent were correctly aware that sealants are really not cost-effective for primary molars, and a mere 23 per cent were correctly aware of the poor cost-effectiveness of sealants when used on premolar teeth. The reason for this poor cost-effectiveness is that premolars currently have a much lower caries prevalence than permanent molars.[23]

Epidemiologic information concerning the great need for selectivity in choosing teeth for fissure sealing, as well as for documenting that permanent molars should dominate in this selection process if sealants are to be cost-effective, has been available since the mid-1980s and was published in Canada in 1988.[23] However, it is very evident that this information is not well known — or, if known, accepted as factual — by Ontario dentists.

The slow progress of dental caries through the enamel on posterior approximal tooth surfaces is well documented. This progress has become even slower with the caries decline.[16,24] Yet, it is apparent from **Table V** that the dentists who responded to this survey believe caries progresses much faster in the average patient, for both primary and permanent teeth, than it actually does. As in an earlier survey in Ontario,[14] about 80 per cent of the dentists reported that caries progresses, on average, more rapidly through the enamel than the research indicates, although their perception that this occurs more rapidly in primary than in permanent approximal tooth surfaces was correct.

Despite the dentists' generally high knowledge about the opportunities to remineralize incipient caries (**Table III**), the percentages of dentists who believe that approximal tooth surfaces with enamel radiolucencies, as seen on bitewing radiographs, should be restored was very high: 60 per cent for 12-year-olds; 28 per cent for 30-year-olds; and 20 per cent for 55-year-olds (**Table VI**). These percentages are much higher than most restorative experts currently recommend.[8,27,28]

Numerous interrelationships between knowledge and beliefs were examined in this study. However, only a limited number of these interrelationships proved to be statistically significant. Those that were significant included the findings that dentists with correct knowledge about the minimal impact of prophylaxis prior to topical fluoride treatment also believed that topical fluorides were needed less frequently and should be related to patient need, and those who correctly knew that dental caries progress was slow believed that bitewing radiograph recall intervals should be longer, and restorative treatment delayed, until the dentin has been penetrated.

As a number of other studies have found, correct knowledge about sealant effectiveness and cost-effectiveness is associated

with greater sealant use (**Table VII**). Additionally, the multiple regression showed that sealant effectiveness variables, in combination with dentists' greater use of continuing education and dental hygienists, best explained the high use of sealants.

Conclusions

Although the respondents' knowledge and beliefs were correct and consistent with current evidence in many areas, some large deficiencies were identified. These include: apparent adherence to fixedly traditional practice intervals; unawareness that professional prophylaxis prior to topical fluoride application is usually unnecessary, and that sealant application to some categories of teeth are usually not cost-effective; over-estimation of the speed of caries progress through the enamel; and, despite good knowledge about the possibilities for demineralization and the preventive benefits of sealants over small fissure lesions, a surprisingly great tendency by many dentists to restore enamel lesions.

To the extent that knowledge and beliefs — correct and incorrect — influence practice, continuing education to correct some of the misconceptions is essential if dentists are to be expected to understand and follow newly emerging diagnostic, preventive and restorative practice recommendations and guidelines. ■

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AUGUST 17 - 20 • **Montréal 1996** • DU 17 AU 20 AOÛT

CANADIAN DENTAL ASSOCIATION CONVENTION / CONGRÈS DE L'ASSOCIATION DENTAIRE CANADIENNE

CDA Conventions and its Partners Offer *You* a Fantastic 1996 Meeting!

The Montréal Convention boasts of more scientific lectures than ever. In addition, two fabulous new programs have been introduced: Keynote Sessions and the Young Dentist Program. To complement the schedule of lectures, participants may choose to attend social and sports activities, visits and tours as well as a great program for their children.

Each year, the organizing committee strives to invite the finest and most knowledgeable speakers that will present lectures on current topics in dentistry. This endeavour is undertaken in order to keep Canadian dentists and members of the dental team fully abreast of the latest developments. Aware that the needs of the dental professionals must be constantly reassessed, committee members seek to develop programs that will address these needs. For this reason, the Young Dentist Program was launched this year and four renowned speakers, experts in the fields of health and nutrition, have been invited to deliver keynote lectures.

In order to offer you this most comprehensive scientific program, the organizers must rely on the support provided by the Convention's loyal partners, the sponsors. Expenses incurred in inviting speakers, providing clinicians with a hospitality lounge or supplying instruments and equipment for hands-on workshops are underwritten in part by companies that appreciate the importance of the national convention for Canadian dentists. Guidelines touching commercialization are strictly enforced in every instance when a lecture is subsidized. This assures the integrity of the information that is disseminated at the Convention.

In addition to the outstanding scientific program, sponsors are responsible for a number of events that have become trademarks of the Convention such as the Golf Day and the Opening Ceremony. Without the continued support of a leading Canadian industry member, the Opening Ceremony simply could not be produced. This year, the comedian Michel Lauzière and the widely acclaimed author of the *Wealthy Barber: The Common Sense Guide to Successful Financial Planning*, David Chilton, will take center-stage at the Opening Ceremony.

The CDA Convention also relies on its partners to offer you the possibility to win airline tickets or a chance to drive a Mercedes-Benz. Even items such as the Convention bags and the several articles they contain are offered for your convenience compliments of our sponsors.

CDA is committed to offering its members the Convention as a benefit of their membership. It can only continue to do so with the support of its dedicated partners. Take a look at the following page and make note of our generous partners. We encourage you to acknowledge their support in bringing you this all encompassing meeting.

Michel Jahjah, D.D.S.
Chair
CDA 1996 Convention
1815 Alta Vista Drive
Ottawa, ON K1G 3Y6

Tel: 1-800-267-6354
Fax: (613) 523-3062

DRAWS & SPONSORS

IT PAYS TO REGISTER EARLY AND VISIT THE EXHIBIT HALL

Every Canadian practicing dentist who pre-registers for the Convention will get a chance to win a one year lease of a **Mercedes-Benz C220 S.E.** compliments of Aurum Ceramic/Classic and Mercedes-Benz Canada. Simply drop your ballot at the Aurum Ceramic/Classic booth in the Exhibit Hall and you could be the lucky person to drive this luxurious sedan.

Those who pre-register also get an opportunity to enter the CDA '96 Air Canada draw. All participants who send in their enrolment form **before July 26** will receive a draw coupon and become eligible to win two Air Canada tickets for any destination served by the carrier throughout North America.

Major Sponsors

Ash Temple LIMITED

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Sponsors

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straumann CANADA

Transitions

YOUNG DENTIST PROGRAM

A program especially designed for those who graduated between 1986 - 1996.

MONDAY, AUGUST 19

The Canadian Dental Association and the Canadian Dental Service Plans Inc. (CDSPI) recognize the needs of the newer members of the dental profession. A full day of lectures and social activities has been planned to afford new dentists the opportunity to gather information that will prove extremely valuable during the first ten years of their career. This program has been developed by the CDA New Dentist Committee in collaboration with the Convention Organizing Committee.

The program of the day is as follows:

7:30 - 8:15	Coffee, muffins and music with other convention participants
8:15 - 9:15	Keynote Session on Nutrition – Robert Pritikin
9:30 - 10:30	The 1990's: A Great Time to Start a Practice – Dr. Paul Bass
10:30 - 11:15	Practical Financial Management for New Dentists – Peter Volpé
11:15 - 12:00	Insurance Protection for Financial Well-Being
12:00 - 1:30	Lunch and visit of the Exhibit Hall
1:30 - 2:15	Aesthetic Posterior Restorations – Dr. Mike Suzuki
2:15 - 3:00	Aging Periodontal Prosthodontic Patients: Problem Solving and Practice Building – Dr. Harry Rosen
3:00 - 3:45	Osseointegration: Its Uses and Abuses – Dr. Perry Goldberg & Dr. Marvin Werbitt
3:45	Cocktails

Simply check the appropriate section of the Enrolment Form to receive your ticket to this program.

PAUL BASS

D.D.S.
Tullahoma, TN

The 1990's: A Great Time to Start a Practice

I Building the unstoppable team.
Building the unstoppable team starts with having a shared vision, created by the doctor and staff jointly. It continues with sound operating principles and open channels of communication.

II Staff with partners.
Staff with real partners brings the team to a level of unconditional commitment. Many auxiliary staff members are committed only at a "job level" simply because they have not been given the opportunity to contribute at a higher level. This presentation will reveal how to get that new level of commitment in place.

III The ultimate win-win.
The ultimate win-win is about creating a long term game plan which will allow our "partners" to win in a very significant and specific way.

IV The Ultimate Success Formula.
The Ultimate Success Formula is a simple four-step approach to achieving any goal we desire. This formula, created by Anthony Robbins, is a bullet proof way to make results show up consistently.

PETER VOLPÉ

Toronto, ON

Practical Financial Management for New Dentists

Dentists just beginning their careers have unique financial challenges and opportunities. The sooner you understand a few simple concepts, the quicker you'll achieve financial success.

This seminar reveals how to:

- set achievable financial goals
- understand your investment alternatives
- use RRSP's effectively
- make the most of tax planning strategies ... and more!

SPEAKER TO BE ANNOUNCED

Insurance Protection for Financial Well-Being

If you're like many young dentists, you'd probably be surprised at the high odds of financial disaster striking you sometime during your career. Fire, theft, illness ... all can have devastating financial consequences. The solution of course is to obtain adequate insurance protection, but many new practitioners are unaware of what protection they need or the options available. This seminar will explain what types of insurance — and how much coverage — you need at the start of your career.

MIKE M. SUZUKI

D.D.S., M.S., D.M.D.
Winnipeg, MB

Aesthetic Posterior Restorations

Today's aesthetic conscious society demands the natural and healthy appearance of the dentition. Hence, the traditional metallic restorations are about to be replaced by tooth coloured materials such as composite resins and ceramics. This presentation will focus on the direct composite resin applications on posterior dentition.

Discussion also includes indirect lab processed composite and porcelain inlays and onlays relative to their clinical applications and limitations.

HARRY ROSEN

D.D.S.
Montréal, QC

Aging Periodontal Prosthodontic Patients — Problem Solving and Practice Building

Aging periodontal prosthodontic patients have a high dental I.Q. Despite a proclivity toward root caries and recurring periodontitis they want to retain their natural and restored teeth. A proposal to repair root caries or to replace a segment of a prosthesis is one that is usually welcomed and accepted. Total remakes and sophisticated surgical interventions are often contraindicated or refused. Techniques will be discussed for salvaging aging dentitions. Grateful patients become excellent practice builders.

PERRY V. GOLDBERG

D.D.S., M.S.D.
Montréal, QC

MARVIN J. WERBITT

D.D.S., M.Sc.D.
Montréal, QC

Osseointegration: Its Uses and Abuses

The introduction of root-form implants into clinical dentistry has opened up new horizons in oral rehabilitation. We now have implant systems and techniques that are reliable, predictable and at the same time versatile enough to admirably meet the challenges placed on us by the new and varied clinical situations we are now undertaking to treat. The clinical material will show how to avoid problems and will dramatically demonstrate how advances in surgical techniques and prosthetic components can be easily incorporated into everyday implant practice to both facilitate patient treatment and maximize function and esthetics.

If you graduated between 1986 and 1996 — registration to the Convention gives you access to the Young Dentist Program.

KEYNOTE SESSIONS

Keynote Sessions are a new segment of the CDA Convention this year. They will take place twice on Monday and Tuesday, from 8:15 am - 9:15 am and from 1:15 pm - 2:15 pm. There are no other lectures scheduled during the times of these sessions, thus allowing as many to attend as possible.

The nutrition industry has grown incredibly as consumers have become more concerned about their health and leading healthy lifestyles. This has created a lot of confusion as the abundance of information available is sometimes contradictory and often inaccurate. The keynote presentations are designed to enable you to become an informed decision-maker by equipping you with reliable and factual information.

In addition, practical applications will be suggested to help you decide how to implement healthier food choices and lifestyle patterns into your life.

All Convention participants are welcome to attend. Each session will have simultaneous interpretation.

MONDAY, AUGUST 19

Murray McDonald Lecture

Morning Session

ROBERT PRITIKIN

Director, Pritikin Longevity Center
Santa Monica, CA

Simultaneous Interpretation: English ➡ French

The Fat Instinct: How You Can Outsmart It!

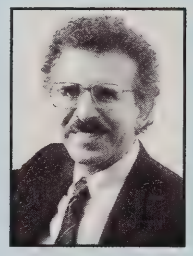
We have known for years that America's high-fat diet and sedentary lifestyle are major contributors to diseases. Yet we continue to choose this destructive lifestyle. We know we should exercise more and we all know better food choices to make, it just seems like we *can't* do it. Why? Are we weak and undisciplined? Absolutely not!

We are victims of the laws of nature: survival of the fittest or, more accurately, survival of the fattest. To survive, we developed instinctive behaviours that would help us seek out, store and conserve fat. They are called the Fat Instinct.

Robert Pritikin will introduce the breakthrough science that has led to the discovery of the Fat Instinct and then present a simple plan of action that can help us outsmart it by learning to change our food preferences and aversions to exercise. By understanding the Fat Instinct, we can make healthy lifestyle choices because we *want* to, not because we *have* to.

SPONSORED BY DENTISTRY CANADA FUND

Afternoon Session



MICHAEL F. JACOBSON

Ph.D.
Washington, DC

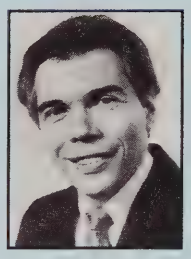
Simultaneous Interpretation: English ➡ French

Nutrition and the Politics of Food

Each year, 400,000 people in the United States die prematurely due to their diet and lack of exercise. The diet that promotes obesity, diabetes, cardiovascular diseases, and certain cancers is high in fat, cholesterol, sodium and sugar and low in fibre. Ironically that is exactly the kind of diet that Americans are encouraged to eat from the time they are young children. And, unfortunately, the federal, state and local governments do virtually nothing to promote more healthful diets. Nevertheless, educational and advocacy campaigns have persuaded millions of people to improve their diets, spurred a number of manufacturers and restaurants to provide more healthful foods, and won legislation that requires nutrition information on all food labels.

TUESDAY, AUGUST 20

Morning Session



JOSEPH SCHWARCZ

Ph.D.
Montréal, QC

Simultaneous Interpretation: English ➡ French

Sense, Nonsense & Science

A little nonsense, now and then, is relished by the best of us. These days, however, we seem to be dealing with more than just a little nonsense. "Channelling" is often presented as factual phenomena, nutritional gurus with no scientific background are preaching to packed audiences about the value of enzymes in food and expert sounding quacks claim cures for virtually any disease using a variety of enemas, magnets or dietary supplements. Even legitimate scientific research is often misinterpreted and inappropriately applied. People are filling themselves with oat bran and soybeans with the hope that all their other dietary sins will then be forgiven and are avoiding apples because of the "poisonous" chemicals with which they are sprayed. There is worry over dioxins in toilet paper, mercury in our fillings, radon in the basement, aluminum in antiperspirants and lead in dinnerware. Only a proper scientific examination of these issues can reveal whether they fall into the category of sense or nonsense.

Afternoon Session

LOUISE LAMBERT-LAGACÉ

B.Sc. Nutrition
Montréal, QC

Simultaneous Interpretation: French ➡ English

The Recipe for a Successful Diet

The latest research and developments in the field of nutrition are at the core of this presentation. Ms. Lambert-Lagacé's aim is to promote better health through better nutrition.

In this keynote session, the lecturer will discuss hot topics such as fat counts, antioxidants and dietary fibres. Ms. Lambert-Lagacé will pinpoint our most common mistakes and provide specific information on selecting the right foods in an overabundant marketplace.

Limited Attendance Courses & Hands-on Workshops

Hands-on workshops and limited attendance courses are designed to give participants an opportunity to study a part of dentistry in a focused and interactive learning environment. Space is limited in these sessions (in some cases to only 40 participants), so register early to avoid disappointment. Consult your Convention preliminary program for complete details.

LIMITED ATTENDANCE COURSES

SATURDAY AUGUST 17

DAVID S. HORNBROOK

D.D.S.
La Mesa, CA

Mastering Aesthetics and Adhesion — Dental Care for the 21st Century

Dentistry is changing at a rate that is difficult to comprehend. New techniques and materials combined with the public's desire to look and feel better about themselves has truly created the "Golden Age of Dentistry". Conservative preparations, combined with true bonding to dentin, have changed dentistry forever. Those who don't take the time and effort to understand the materials and learn the techniques will be lost as dentistry enters the 21st century. This course is designed to maximize your learning experience and benefit to your patients by introducing and expounding on ideas that can be used immediately and reliably in your own office.

Subjects covered in this presentation include:

- What is "adhesive dentistry" and how is it changing the way we practice dentistry?
- Dentin bonding
- Direct Composite Bonding
- Indirect Posterior Resins
- Porcelain Veneers, Inlays, Onlays, and All-Porcelain Crowns
- Miscellaneous Techniques

SATURDAY AUGUST 17

LOUIS TOUYZ

B.D.S., M.Sc.(Dent), M.Dent(POM)
Montréal, QC

A New Look at Periodontics in the Nineties

Current challenges in periodontics require that patients be well informed about the disease. The discussion will reveal that all periodontal diseases are not the same and diagnosis in the nineties demands a focussed clinical classification. Although oral malodor may derive from periodontitis, knowing which of the five types exists allows dentist to avoid pitfalls and problems. The first part of this course includes an initial assessment and ranking of treatment, an updated classification, a review of oral malodor and insights into tobacco and oral health. The second part reviews dental sensitivity, major causes of abfractions and describes, in detail, surgery for elective clinical crown lengthening on single rooted teeth.

Direct comparisons between cosmetic and esthetic dentistry stresses how periodontics is part of modern dentistry and how general dental practitioners should be able to immediately identify with this subject material and acquire new skills and insights for upgrading their practice.

SUNDAY AUGUST 18

WILLIAM BLATCHFORD

D.D.S.
Sunriver, OR

Presenting Ideal Treatment and Getting a Yes!

Asking the right questions of patients which allow them to see the "never-before-thought-of" possibilities for their smiles is one of the goals in this session.

Here are just a few of the things that the lecturer will cover:

- specific verbal skills for the team in case presentation
- how to have your patients choose new smiles over big screen tv's, sporting goods, travel, etc.
- what patients want and how you can provide it. Working harder is not the answer.
- how to have patients accept your best treatment, not just what insurance pays.
- verbal skills necessary to collect from patients without sending statements.
- how to schedule for a perfect day with blocks of time reserved for specific treatment and patients.

HANDS-ON WORKSHOPS

SATURDAY AUGUST 17 & SUNDAY AUGUST 18

PIERRE BOUDRIAS

D.M.D., M.S.D.
Montréal, QC

Implants: Basic Prosthetic Certification Course

This two-day certification course will consist of lectures and hands-on portions. This course has been specifically designed to provide participants with a study of implant supported restorations ad modum Bränemark. It will focus on cooperative treatment planning by the dentist and his collaborators to achieve esthetic and functional results. The completely edentulous, partially edentulous and single tooth cases will be reviewed in detail. The course will feature a hands-on exercise on models using BRÄNEMARK SYSTEM components and the Nobelpharma TORQUE CONTROLLER™.

SUNDAY AUGUST 18

HERBERT I. BADER

D.D.S.
Boston, MA

&

JANE JONES

R.D.H.
Lake Worth, FL

Scaling and Root Planing

The most difficult and critical modality of therapy in dentistry is scaling and root planing. This participation course reviews the most current concepts and techniques for hand and powered instrumentation. The participant will be exposed to the theory and practice of hand and ultrasonic instrumentation and be given an opportunity to compare, evaluate and practice with the latest generation of piezoelectric instrumentation, on a typodont. The discussion portion will cover the most current literature and how it relates to the clinical efficacy of ultrasonics.

SUNDAY AUGUST 18

GARY GLASSMAN

D.D.S.
Toronto, ON

&

KENNETH SEROTA

D.D.S., M.M.Sc.
Toronto, ON

Endodontic Impressionism: A Palette for Excellence

This hands-on participation course addresses the concepts and details the skills necessary for acquiring the expertise to perform the highest calibre endodontics. The attendee will become proficient with the use of the profile nickel-titanium rotary instrumentation system, the "apex last" approach to cleaning and shaping, and with vertical condensation of thermosoftened gutta-percha using both the Schilder technique, the Obtura II system and System B.

AUGUST 17 - 20 • **Montréal 1996** • DU 17 AU 20 AOÛT

CANADIAN DENTAL ASSOCIATION CONVENTION / CONGRÈS DE L'ASSOCIATION DENTAIRE CANADIENNE

ONE FORM PER PERSON

PRE-REGISTRATION & HOTEL RESERVATION FORM • Please PRINT

1. Use **1 FORM FOR EACH INDIVIDUAL** you would like to register. You may photocopy the enrolment form, or you can obtain additional forms by contacting CDA Conventions at 1-800-267-6354.
2. **EACH** individual's name should be printed clearly in the appropriate section. **EACH** individual form should select a **DELEGATE TYPE** in order to register for the Convention.

Check one: ☐ Dr. ☐ Mr. ☐ Ms.	Family Name		
	First Name		Sex: ☐ M ☐ F
Street address			
City	Province	Postal Code	
Office Telephone ( )		Home Telephone ( )	
Fax ( )		CDA Membership Number	

LIMITED ATTENDANCE COURSES

Saturday, August 17th —

David S. Hornbrook — Mastering Aesthetics and Adhesion: Dental Care for the 21st Century — All day lecture
Dentist ..... $135 _____
Dental Staff (non-dentist) ..... $ 65 _____

Louis Touyz — A New Look at Periodontics in the Nineties — All day lecture
Dentist ..... $135 _____
Dental Hygienist ..... $ 65 _____

Sunday, August 18th —

William Blatchford — Presenting Ideal Treatment and Getting a Yes! — All day lecture
Dentist ..... (7% GST included) $135 _____
Dental Staff (non-dentist) ..... (7% GST included) $ 65 _____

GST is included in the Limited Attendance Practice Management courses. GST is not charged on Limited Attendance and Hands-on scientific courses.

Lunch is included in all day Limited Attendance and Hands-on courses.

***NOTE:** Every dentist enrolled for the Convention can register two (2) non-dentist staff members for the convention proper FREE OF CHARGE. The first or second non-dentist staff member to register *with* a dentist, choose "Registration Fees" Nil. Send Registration Form with that of the dentist.

HANDS-ON WORKSHOPS

Saturday, August 17th & Sunday, August 18th —

Pierre Boudrias — Implants: Basic Prosthetic Certification Course — Two day hands-on workshop
Dentist (limited to 50 participants) ..... $295 _____

Sunday, August 18th —

Herbert I. Bader & Jane Jones — Scaling and Root Planing — Half day hands-on workshop
Dentist/Dental Hygienist (limited to 40 participants) .. $ 115 _____

Gary Glassman & Kenneth Serota — Endodontic Impressionism: A Palette for Excellence — All day hands-on workshop
Dentist (limited to 40 participants) ..... $ 195 _____

CONVENTION

Choose only one delegate type. 1 registrant per form.

☐ **Dentist**
Member of CDA ..... $ Nil _____
Non-member of CDA ..... (7% GST included) $175 _____
☐ I will attend the Young Dentist Program (Graduate 1986-96) ..... $ Nil _____
My year of Graduation _____

☐ **Spouse** ..... (7% GST included) $ 98 _____

☐ **Dental Hygienist** ..... (7% GST included) $ 98 _____
Dental Hygienist (See note below)* ..... $ Nil _____

☐ **Dental Assistant** ..... (7% GST included) $ 98 _____
Dental Assistant (See note below)* ..... $ Nil _____

☐ **Office Personnel, Office Manager, Receptionist** ..... (7% GST included) $ 98 _____
Office Personnel, Office Manager, Receptionist (See note below)* ..... $ Nil _____

☐ **Dental Technician** ..... (7% GST included) $ 98 _____

☐ **Student Dentist** ..... $ Nil _____
☐ **Student Dental Hygienist** ..... $ Nil _____
☐ **Student Dental Assistant** ..... $ Nil _____

* Students must provide proof of full-time attendance.

Are you the person or one of the persons responsible for purchases in the office? ☐ **Yes**

GST Registration Number: R106845209

SOCIAL EVENTS

☐ **Opening Ceremony** — Sunday, August 18th
(Subject to space availability — One ticket per Registration Form)
Will attend ☐ Yes ☐ No ..... $ Nil _____

☐ **Meet & Greet** — Sunday, August 18th
..... (7% GST included) $ 55 _____

☐ **President's Gala** — Dinner Cruise — Monday, August 19th
..... (7% GST included) $ 75 _____

☐ **Golf Day** — Sunday, August 18th
..... (7% GST included) $125 _____

☐ **Fun Run** — Tuesday, August 20th a.m.
..... (7% GST included) $ 25 _____

☐ **Visits and Tours** (See page 14 for details)
City Tour — August 17 ..... (7% GST included) $ 50 _____
Old Montréal — August 18 ..... (7% GST included) $ 50 _____
Knowlton — August 19 ..... (7% GST included) $ 50 _____
Shopping — August 20 ..... (7% GST included) $ 50 _____

☐ **Children (6-12 years)** Child's Age:_____
Sunday program ..... (7% GST included) $ 48 _____
Monday program ..... (7% GST included) $ 48 _____
Tuesday program ..... (7% GST included) $ 48 _____

TOTAL ..... $ _____

Person/company
responsible for payment: _____

☐ I wish to pay the above total by credit card:

☐ MasterCard ☐ VISA

Card # _____

Expiry Date _____

Name of Cardholder _____

SIGNATURE _____

☐ I enclose a cheque payable to the Canadian Dental Association.
Post-dated cheques will not be accepted.

CANCELLATION POLICY:

- Cancellation received, in writing, on or before July 26, 1996 — full refund
- Cancellation received, in writing, after July 26, 1996 — subject to a 25% administrative charge

NO REFUND AFTER AUGUST 10, 1996

☞ INFORMATION ON REGISTRATION:

All participants registered for the Convention:

- have access to all general lectures of the Convention proper
- have access to the exhibit hall
- have access to the Opening Ceremony
- are entitled to register for the appropriate limited attendance lectures and hands-on courses
- are entitled to register for social events, visits and tours

Spouses and children have access to the Opening Ceremony only if they register for one or more of the Convention's day programs or if registered for the Convention. Spouses not registered for the Convention do not have access to the general lectures or to the exhibit hall.

To ensure that your requests are met — ***please register early***. Advance registrations will be accepted until **July 26th, 1996** after which date forms will be returned to the sender. Each on-site registration will be subject to a $30 administrative fee (GST included).

HOTEL RESERVATION

Type of Room:

☐ Single ☐ Double ☐ Twin ☐ Other (please specify)

_____

☐ Smoking ☐ Non-Smoking

Special Requests: _____

_____

Sharing with _____

Indicate your choice of hotel* (by numbering the boxes):

☐ Montréal Bonaventure Hilton ..... $149.00 single/double
☐ Queen Elizabeth ..... $148.00 single/double
☐ Château Champlain ..... $135.00 single/double
☐ Radisson/Auberge des Gouverneurs ..... $120.00 single/double
☐ Novotel ..... $106.00 single/double

* Prices do not include taxes.

Arrival Date: _____

Arrival Time: _____

Departure Date: _____

All changes and/or cancellations must be made **IN WRITING** through CDA Conventions. Fax to (613) 523-3062.

In order to reserve a room, a guarantee for the first night is essential. The guarantee will apply to the first night ONLY. To cancel your reservation advise CDA Conventions at least three (3) days prior to your projected arrival date.

CHEQUES WILL NOT BE ACCEPTED.

☐ MasterCard ☐ American Express ☐ VISA

Card # _____

Expiry Date _____

Name of Cardholder _____

SIGNATURE _____

DEADLINE for Reservations: July 26, 1996

ACCOMMODATION

☐ I do not require accommodation
☐ Other arrangements have been made

MAIL Pre-registration and Hotel Reservation Form with payment to:

1996 CDA Convention
1815 Alta Vista Drive
Ottawa, Ontario K1G 3Y6

OR FAX

(if paid by credit card): (613) 523-3062

MAKING YOUR AIRLINE RESERVATIONS

Special arrangements have been made with Air Canada to offer participants discounts on airfares.

To take advantage of this service, you must call Air Canada Convention Central at **1-800-361-7585** and quote event **CV960671**.

GENERAL SCIENTIFIC PROGRAM

MONDAY, AUGUST 19

The CDA 1996 Convention boasts a great roster of extremely knowledgeable speakers in a scientific program designed to exceed your expectations. On Monday and Tuesday, you will have the opportunity to choose among several concurrent lectures on the most diversified topics in the field of dentistry. The following listing is preliminary. More lectures will be added, consult the blue pages of future issues of the CDA Journal for Convention program updates.

HERBERT I. BADER
D.D.S.
Boston, MA

JANE JONES
R.D.H.
Lake Worth, FL

New Perspectives in Soft Tissue Management

MARION BALLA
M.Ed., M.S.W., C.S.W.
Ottawa, ON

Effective Communication with Staff and Clients in the Dental Environment

PAUL BASS
D.D.S.
Tullahoma, TN

Practice Management for the Next Millenium

GISÈLE BOURGEOIS
B.A.
Montréal, QC

Financial Planning for Dental Staff: Creating Financial Wealth

MICHEL COUTURE
D.M.D., Dip. Paro.
Montréal, QC

The Probe Examination: The Essence of Screening, Diagnosis and Periodontal Treatment

ERIC CARON
D.M.D.
Montréal, QC

Temporization: Materials and Techniques for Today

ALAN J. DRINNAN
D.D.S., M.D.
Buffalo, NY

Common Oral Lesions of Interest to the Dental Team

RONALD L. ETTINGER
D.D.S.
Iowa City, IA

Management of Elderly Patients in the Private Dental Office

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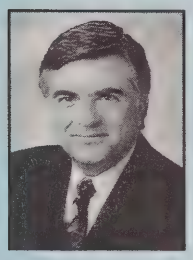

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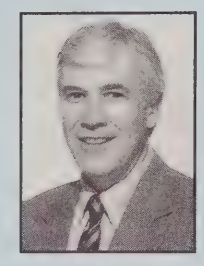

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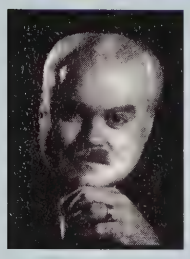
Once again, as a membership benefit, CDA is offering member dentists free registration to the 1996 Convention in Montréal. AND, to foster the spirit of togetherness in 1996, every Canadian dentist who pre-registers may enrol 2 non-dentist staff members for free! Take advantage of these great savings for the entire office and register before July 26, 1996.

GENERAL SCIENTIFIC PROGRAM

TUESDAY, AUGUST 20



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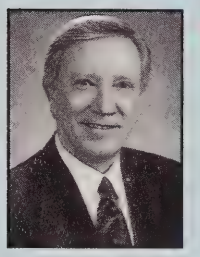

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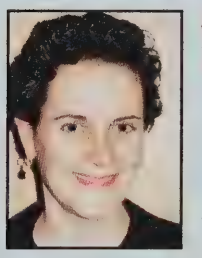

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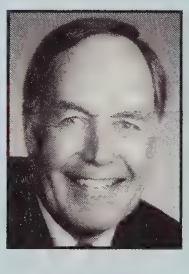

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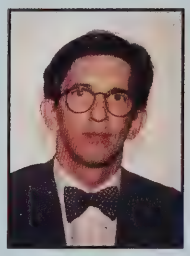

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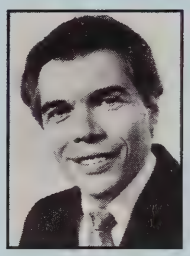

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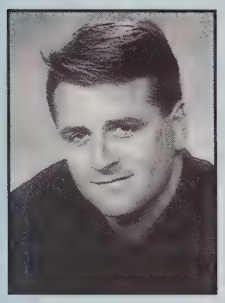
OPENING CEREMONY

Sunday, August 18 • 5:00 pm -7:00 pm



< DAVID CHILTON

MICHEL LAUZIÈRE >

This year, the Opening Ceremony is a NOT-TO-BE-MISSED event at the Convention.

First, we welcome **MICHEL LAUZIÈRE**, a world-renowned comedian. From Berlin to Tokyo and from New York to Santiago, Michel Lauzière is an exceptional performer who "thrives on weird ideas". His performance will please all ages and offer something you've probably never seen before!

The evening will rise to a crescendo as **DAVID CHILTON** takes center-stage with a presentation entitled, **"Learn for yourself — Nobody cares about you more"**. Author of Canada's hottest selling novel of the nineties, *The Wealthy Barber*, David Chilton has helped millions of Canadians with sound and sensible advice in the area of personal money management. If you've been put off by dry speeches on the subject of finances, be prepared for a speaker whose confident, common sense approach will help you achieve the financial success you desire. His witty delivery will have you laughing as you learn.

This year, you cannot afford to miss the Opening Ceremony. Reserve your place today!

Clowns will entertain the children during David Chilton's presentation.

SUNDAY AUGUST 18

MEET & GREET

7:00 - 10:00 pm

CASINO NIGHT

The Meet & Greet event, **scheduled to follow the Opening Ceremony**, offers you an opportunity to try your luck at the Casino. A casual and upbeat atmosphere awaits you as the croupiers bid you to "place your bet" at the various gaming tables. **Bring your family** and meet your friends and colleagues while you enjoy a light meal and play to win (or lose!) with our funny money.

MONDAY, AUGUST 19

7:00 - 8:00 pm **cocktails**
8:00 pm onwards **dinner, cruise & dancing**

Start the evening with cocktails on the deck of a boat anchored in the Montréal harbour as the setting sun bathes Montréal in beautiful golden hues. Then, enjoy a sit-down dinner surrounded with the sounds of live music. During the course of the evening, you can board a replica of a Mississippi Riverboat and take a romantic cruise on the Nouvelle-Orléans or remain at the harbour and dance under the stars. You are encouraged to dress smart casual for this event.

To register, consult your CDA 1996 Convention preliminary program which was mailed to your office in March 1996 or see the registration forms found within this section of blue pages.

VISITS & ONE-DAY TOURS

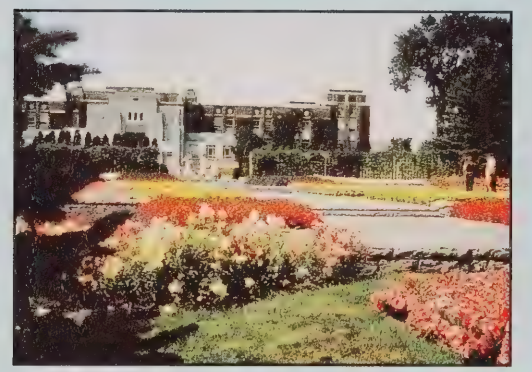
The CDA Convention welcomes registered accompanying spouses to visit the exhibit hall, attend the keynote sessions and the general interest lectures of the scientific program. Social events are also open to accompanying spouses as well as delightful visits and one-day tours. Lunch and transportation are included in the following day trips.

Saturday, August 17 — *Deluxe City Tour*

An enjoyable tour of Montréal to some of the city's most celebrated attractions. An experienced guide will highlight various sites including: Notre-Dame Basilica, Old Port, Mount Royal Lookout, St. Joseph's Oratory and others. Also, this day trip includes visits to The Olympic Tower, Montréal Botanical Gardens and The Biodôme.

Sunday, August 18 — *Discover Old Montréal*

Begin the day's events on a guided walking tour of Old Montréal then enjoy lunch in one of Old Montréal's fine restaurants. The afternoon will be spent at Point-à-Callière, the Museum of Archaeology which recounts the history of Montréal through the 17th, 18th and 19th centuries.



Monday, August 19 — *Day Trip to Knowlton*

Enjoy an historical walking tour of this charming little town established in 1802. Next on the agenda is lunch at a quaint old inn. The afternoon will be spent at your leisure browsing through antique shops, boutiques, craft stores and shopping in many brand name factory outlets.

Tuesday, August 20 — *A Shopping Extravaganza*

This is your opportunity to shop "behind closed doors" in various manufacturer and designer showrooms. The next season's selections will be on display and at your disposal for purchase if you choose. Savings of up to 50% on selected designer wardrobes and up to 40% on jewellery.

See the CDA 1996 preliminary program for more details.

1996 FDI Dental Congress & Out-of-Country Seminars

A CDA membership benefit that takes you around the world

That's right, the Canadian Dental Association gives member dentists the opportunity to travel to a foreign destination and attend dental seminars at the same time. In 1996, the FDI World Dental Congress will be held in Orlando, Florida from September 28 through October 1. CDA has designed (in cooperation with Tourcan Vacations) pre- and post-Congress tours in the South. CDA member dentists may take advantage of the following travel programs:

Gulf of Mexico Cruise	September 23 - 27	*Galapagos Islands*	October 2 - 10
Walt Disney World	October 2 - 6	*Costa Rica*	October 2 - 11

In addition, Out-of-Country dental seminars to foreign destinations have also been planned.

Those remaining for the 1996 year are:

South Africa	May 3 - 16	*Morocco*	June 29 - July 14

For more information, contact CDA Conventions at 1-800-267-6354.

DENTISTRY CANADA FUND

Dentistry Canada Fund
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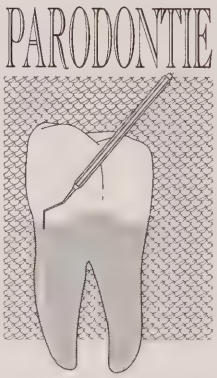
PLANNED GIVING PROGRAM

Dentistry Canada Fund is pleased to announce the launch of its comprehensive Planned Giving Program which contains a wide variety of options for those individuals who wish to make a significant gift to their profession and have a large portion of that donation (in many cases well over 50%) funded by the government. Here is our menu of choices:

Gift Type	Options	Tax Credit
Cash	a) Outright gift of any size now; b) Bequest under will, specific amount or *percentage of estate,* released following probate	*a) Now; b) In final tax return.*
Appreciated Property	Any appreciated property such as stocks, real estate, art works, coins, etc. can be donated at their current market value. As announced in the 1996 federal budget, for the first time, there will be **no capital gains tax to pay** on any gift made this way. A further benefit of the 1996 budget is that an individual's maximum charitable giving limit has been icreased from 20% to 50% of net income—significantly improving the speed of which tax credits can be used.	Now and every consecutive year until the donated value has been fully credited.
Living Legacy Builder	A new product, custom designed for DCF by ITT Hartford Life Insurance Company enables the donor to turn an already generous gift into a much larger bequest that could become a named endowment and fund projects in the particular area of interest of the donor.	Annually, based on the premium.
Stripped Bonds	Our partners at Midland Walwyn Capital Inc. have joined with us to offer donors the flexibility and convenience of Government guaranteed compounding interest "stripped" bonds. By purchasing the bond now at a significant discount, the donor can make a substantial gift to DCF and decide exactly when this gift will mature.	Now.
Charitable Remainder Trust	This very special gift is for those who wish to creditor-proof their assets, retain the income from those assets and, upon death, leave the remainder as a legacy to DCF. The minimum size of the asset is $200,000 and there are many options. An individual trust will be devised for each donor with DCF and a Trust Company.	Now, based on the present value of the trust.

Further details about any of the components of this program can be obtained from DCF Executive Vice-President, James Wegg (1-800-267-6354). Future issues of the CDA Journal will contain more detailed examples and explanations of the choices listed above. These articles will further demonstrate how, over time, significant gifts can be made to Canada's only national, charitable organization dedicated to optimal oral health for all Canadians and, as many other dental professionals have already discovered, you'll be in good company.



L'irrigation sous-gingivale, une hérésie?

R. Bouclin, B.Sc.
P. D'Aoust, B.Sc., DMD
R.G. Landry, DMD, Dip. Perio., M.Sc., MRCD(C)

SOMMAIRE

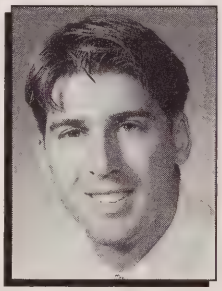
La principale cause de la gingivite et de la parodontite adulte est d'origine bactérienne. Cet article est une revue de la littérature pertinente des travaux de recherche sur l'irrigation sous-gingivale avec certains agents antimicrobiens d'une part; d'autre part, il évalue la pertinence clinique de cette technique. Afin que l'agent antimicrobien atteigne le fond du cul-de-sac, la canule doit être enfoncée à environ 3,0 mm sous-gingivalement.[14] L'irrigation sous-gingivale n'offre pas un effet antimicrobien additionnel au surfaçage mais elle peut contribuer à maintenir les effets bénéfiques de ce dernier pour une durée prolongée. L'effet de l'irrigation demeure néanmoins temporaire. Elle devrait donc être considérée comme une méthode complémentaire pour le traitement de la gingivite et de la parodontite de l'adulte lorsque le surfaçage radiculaire seul n'est pas efficace.

Mots clés: *irrigation sous-gingivale, gingivite, parodontite adulte, chlorhexidine, peroxyde, méthionine, cul-de-sac parodontal.*

ABSTRACT

Bacteria are the principal causal factor for gingivitis and adult periodontitis. This article is a review of the pertinent literature regarding subgingival irrigation with antimicrobial agents. Furthermore, the clinical significance of this technique is evaluated. In order for the antimicrobial agent to reach the base of the periodontal pocket, the canula must be placed at least 3.0 mm subgingivally.[14] Subgingival irrigation offers no added antimicrobial effect over root scaling alone, but may extend the therapeutic effect of scaling. The effect of subgingival irrigation is none the less temporary. Subgingival irrigation must be regarded as an alternative treatment for gingivitis and adult periodontitis when root scaling alone is not sufficient.

Key words: *subgingival irrigation, gingivitis, adult periodontitis, chlorhexidine, peroxide, methionine, periodontal pocket.*


M. Robert Bouclin

Dr Paul D'Aoust

Dr René Guy Landry

Introduction

La gingivite ainsi que la parodontite sont des maladies multifactorielles.[8] Cependant, il est généralement reconnu que l'agent causal principal est d'origine bactérienne.[11,37,40,49] La prévention et le traitement de ces maladies chroniques sont basés sur l'interférence de la colonisation aussi bien que sur la croissance des populations bactériennes. La thérapie parodontale traditionnelle consiste en l'exérèse mécanique de bactéries et de produits bactériens retrouvés à la surface des racines.[1] Alors que cette méthode s'avère efficace pour diminuer la concentration de bactéries, plusieurs pathogènes demeurent à la surface radiculaire et dans les culs-de-sac parodontaux.[29,43] La recolonisation bactérienne peut se produire en moins de 60 jours après l'exérèse mécanique.[32] Afin d'assurer un contrôle à long terme sur l'accumulation des colonies bactériennes, plusieurs chercheurs ont proposé l'utilisation de produits chimiques comme adjuvants aux techniques mécaniques. En particulier, certains agents antimicrobiens se sont avérés capables d'altérer la flore parodontale et d'inhiber les effets destructeurs des pathogènes parodontaux.[35,50] L'irrigation supragingivale avec chlo-

Tableau I

Effet de divers agents antimicrobiens sur la repopulation bactérienne selon divers facteurs

Étude	Agent	Concentration (pourcentage)	Thérapie (jours)	Surfaçage	Repopulation (jours)
Westling[48]	CHX	0,20	2	non	5
Baer[2]	H_2O_2	1,50	1	non	7
Schmid[34]	SnF_2	1,64	1	non	7
Haskel[15]	CHX	0,20	14	non	28
Lander[19]	CHX	0,20	1	non	25
Mazza[27]	SnF_2	1,64	2	non	56
Khoo[18]	CHX	0,20	28	oui	84+
Macauley[26]	CHX	0,02	28	oui	84+
MacAlpine[25]	CHX	2,00	168	oui	168+
Braatz[6]	CHX	2,00	168	oui	168+

rhexidine (0,2 pour cent) procure certains bénéfices.[44] Selon la littérature, toutes les autres médications utilisées en irrigation supragingivale ne sont pas valables. L'irrigation sous-gingivale dans le traitement de la parodontite de l'adulte est controversée.[13,36] Les études préconisant que l'irrigation sous-gingivale est une monothérapie et une combinaison avec le surfaçage radiculaire nous procurent une bonne idée des bénéfices et limitations de cette méthode thérapeutique. Cet article se veut une revue de la littérature pertinente des travaux déjà publiés sur l'irrigation sous-gingivale avec agents antimicrobiens d'une part; d'autre part, il fait l'évaluation de la pertinence clinique de cette technique.

Pénétration dans le cul-de-sac par l'irrigation sous-gingivale

Pour que l'irrigation sous-gingivale soit un mode de traitement efficace, l'agent antimicrobien doit atteindre le fond des culs-de sac parodontaux. Pitcher et al ont montré qu'une solution de chlorhexidine pénètre jusqu'à environ 1,8 mm dans les culs-de-sac parodontaux à la suite de l'irrigation, alors qu'une infiltration de 0,2 mm est enregistrée après l'utilisation vigoureuse d'un rince-bouche conventionnel.[27] Selon Hardy et al, l'irrigation n'atteint pas la bordure apicale des culs-de-sac parodontaux lorsque la solution est relâchée à l'extrémité coronale de la gencive libre. Si la seringue est enfoncée apicalement de 3,0 mm ou à la moitié de la profondeur du cul-de-sac, l'agent antimicrobien atteint le fond du cul-de-sac.[5,9,10,14,21] D'autres facteurs peuvent affecter l'irrigation sous-gingivale, dont le tartre, le design de l'irrigateur et la force d'irrigation.[21] L'irrigateur butant sur le tartre dans les culs-de-sac profonds, il devient primordial de surfacer au préalable la racine. Enfin, il importe peu que la canule soit ouverte à son extrémité ou sur sa surface latérale. La force de l'irrigation n'étant pas importante, elle devrait être minimale, afin de réduire au maximum la projection des bactéries dans les tissus.[21] Les résultats de l'irrigation sous-gingivale sont prometteurs lorsque le clinicien effectue l'opération. Par contre, il paraît impossible pour le patient d'employer adéquatement lui-même cette technique comme méthode d'hygiène.[23] L'irrigation sous-gingivale diminue la profondeur moyenne des culs-de-sac de 1,0 mm[15] alors que d'autres études concluent à des réductions moyennes moindres.[19,42,46] Cependant, si le surfaçage radiculaire précède l'irrigation sous-gingivale, la profondeur des culs-de-sac diminue de 2,0 à 3,0 mm.[6,25,38,46] Si l'objectif est la réduction des culs-de-sac, il devient donc évident qu'il faut surfacer les racines avant l'irrigation sous-gingivale.

Période d'efficacité

La période d'efficacité de l'irrigation sous-gingivale varie selon l'agent utilisé, la concentration de l'agent et la durée de la thérapie. La chlorhexidine demeure la médication de choix pour l'irrigation sous-gingivale. Si elle est utilisée durant plus de six semaines, des taches extrinsèques brunes qui noircissent avec le temps affectent l'esthétique de la denture. De plus, les recherches ont démontré une différence significative lorsque le processus est précédé par le surfaçage radiculaire.[2,6,15,18,19,25-27,34,48] Le **Tableau I** résume les résultats de quelques études pertinentes selon que le surfaçage radiculaire soit combiné ou non à l'irrigation sous-gingivale.

Effets sur la flore pathogène

Lorsque l'irrigation sous-gingivale est combinée au surfaçage mécanique, aucun régime d'irrigation testé n'offre un effet antimicrobien additionnel.[6,25,46] Par contre, ce type d'irrigation peut contribuer à maintenir les effets bénéfiques du surfaçage radiculaire pour une durée prolongée.[4,26] Cette approche thérapeutique augmente la concentration de cocci et diminue celle des motiles et des spirochètes.[18,22] Wikesjö et al ont montré que l'irrigation répétée à

toutes les deux semaines pendant six mois avec le peroxyde d'hydrogène diminue significativement la concentration d'*Actinobacillus actinomycetemcomitans (Aa)* dans les culs-de-sac parodontaux.[49] Cependant, lorsque les microorganismes pathogènes suspectés sont réduits, ils ne sont pas éliminés. De plus, l'effet du peroxyde persiste jusqu'à cinq mois après la fin de l'expérimentation. Cette observation est pertinente puisque qu'on croit qu'une corrélation existe entre la présence de *Aa* et la parodontite juvénile[52] et celle de l'adulte.[37,41] L'irrigation avec 0,02 pour cent de chlorhexidine ou 0,05 pour cent de métronidazole n'augmente pas le rendement d'une irrigation sous-gingivale lorsqu'elle est comparée à un placebo.[46] La concentration de chlorhexidine augmentée à 0,1 pour cent[33] et 0,2 pour cent[15] procure le même résultat. Selon une étude de Haskel et al, l'effet maximal de l'irrigation quotidienne sur les bactéries se produit 14 jours après le début du traitement.[15] La réduction de la population bactérienne est toujours plus appréciable d'une part; et la suppression des microorganismes est plus longue si le surfaçage radiculaire précède l'irrigation sous-gingivale.[6,24-26,38,46]

Paramètres cliniques

L'irrigateur sous-gingival standard produit une pression hydrostatique qui n'excède pas 60 mm Hg et peut être considérée physiologiquement acceptable.[3] Watts et al ont observé que l'irrigation sous-gingivale diminue significativement l'inflammation parodontale et la profondeur du cul-de-sac gingival mais n'élimine pas l'inflammation.[45] En 1989, Vignarajah et al ont testé les effets d'une irrigation sous-gingivale quotidienne avec 0,1 pour cent de chlorhexidine sur l'indice de plaque bactérienne, le saignement au sondage et la profondeur des culs-de-sac parodontaux. Les résultats indiquent que l'irrigation contribue à la réduction de ces trois paramètres et donne de meilleurs résultats de guérison de la gingivite et de la parodontite de l'adulte qu'un traitement de brossage quotidien seul.[42] De plus, la solution de 0,1 pour cent de chlorhexidine montre des résultats significativement meilleurs que ceux de l'irrigation avec une solution saline.[42] Donc, il semble que l'irrigation sous-gingivale avec un agent antimicrobien agit de façon positive contre la gingivite.

Cependant, pour que cette technique soit utilisable en cabinet, l'effet doit s'avérer durable. Pour un cul-de-sac de 5,0 mm, le liquide créviculaire se remplace après 90 secondes.[12] Wennstrom et al ont observé que l'action de l'irrigation sous-gingivale avec la chlorhexidine ou le peroxyde d'hydrogène sur l'indice de saignement et la profondeur des culs-de-sac n'est que temporaire. Une amélioration de ces paramètres est observée dans les six premières semaines. Après 32 semaines, aucune différence significative n'est détectable entre les culs-de-sac de contrôles et expérimentaux.[47] Selon les résultats de Schmid et al, l'effet d'une seule irrigation avec 1,64 pour cent SnF_2 ne dure qu'une semaine avec un effet maximal après trois jours.[34] À long terme, l'irrigation (avec solution saline, chlorhexidine 2,0 pour cent ou tétracycline 50 mg/ml) aux deux semaines pendant 24 semaines n'améliore pas le rendement du surfaçage radiculaire.[25] Braatz et al ont obtenu des résultats semblables pour l'irrigation avec la chlorhexidine 2,0 pour cent.[6]

L'irrigation sous-gingivale professionnelle ou par le patient

L'irrigation professionnelle peut se faire à l'aide soit d'une seringue,[6,17] soit d'une canule,[17,26,42,45] soit d'une unité ultrasonique.[28,31] Les résultats avec l'emploi d'une canule sont comparables avec ceux de la seringue.[17] L'irrigation sous-gingivale est un traitement intéressant si l'agent antimicrobien rejoint le fond du cul-de-sac parodontal. Les études à court terme montrent que le traitement est plus efficace lorsque le dentiste effectue l'opération. Ce procédé nécessite beaucoup de temps de la part du clinicien et le rapport coût-bénéfices est douteux. De plus, le traitement doit être répété une ou deux fois par semaine pour être efficace.[18] Ainsi, si l'on réduit la fréquence des irrigations, les résultats ne sont pas intéressants. Enfin, lorsque le patient irrigue lui-même, l'irrigation n'atteint que 50 à 100 pour cent de la profondeur des culs-de-sac.[10,14,16]

L'expérience clinique amène le clinicien à constater que peu de patients ont la dextérité nécessaire pour irriguer d'une façon acceptable avec la canule placée en position sous-gingivale.

Chez le patient en phase de maintien après la phase chirurgicale, alors que les culs-de-sac profonds ont été traités, la pénétration de la canule serait satisfaisante.[7]

Conclusion

Le potentiel de l'irrigation sous-gingivale est limité à six facteurs locaux: la susceptibilité des pathogènes parodontaux aux agents antimicrobiens, le volume très restreint que représente le cul-de-sac parodontal, la rapidité du remplacement du liquide créviculaire,[12] la surface minime que représente la dent et l'épithélium sulculaire, la dextérité de l'opérateur (le clinicien ou le patient) pour aller rejoindre le site malade et enfin, la contamination par la suppuration et le sang, réduisant probablement la substantivité de toute médication.

Il est important de noter qu'aucune étude n'a encore évalué la substantivité des solutions sur le marché lorsque l'une ou l'autre est placée dans le cul-de-sac. L'irrigation sous-gingivale en parodontie représente la première génération d'un système complémentaire au surfaçage radiculaire. Plusieurs travaux de recherche nous amènent à privilégier ceux de la deuxième génération déjà disponible pour le clinicien en Asie et en Europe, soit l'utilisation d'agents comme les polymères à titre de véhicule plutôt qu'une solution.[20] L'irrigation sous-gingivale peut s'avérer utile pour le traitement d'un site où l'accès est difficile, comme les furcations et les culs-de-sac étroits.

Donc, l'irrigation sous-gingivale devrait être considérée comme une méthode complémentaire pour traiter la gingivite chronique et la parodontite de l'adulte, après le détartrage et le surfaçage radiculaire, sans escompter de résultats à long terme. ■

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In children and elderly patients, as well as in patients of all ages with chronic or debilitating disease, the response to local anesthetics may be modified (see Dosage and Administration).

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Ultracaine should be used with extreme caution in patients whose medical history and physical evaluation suggest the existence of thyrotoxicosis or diabetes.
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Solutions containing a vasoconstrictor, e.g. epinephrine, should be used with caution, if at all, in patients who are receiving MAO inhibitors or tricyclic antidepressants, because severe, prolonged hypertension may result.
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Dosage and Administration
As with all local anesthetics, the dosage varies and depends upon the area to be anesthetized, the vascularity of the tissues, the number of neuronal segments to be blocked, individual tolerance and the technique of anesthesia. The lowest dosage, needed to provide effective anesthesia should be administered.
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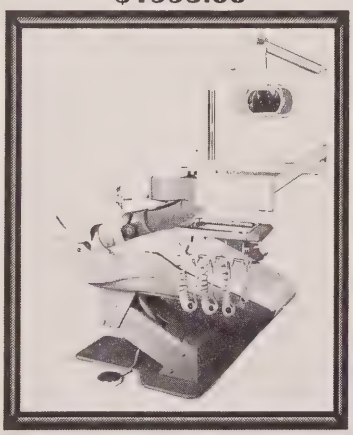

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BOOK REVIEWS

Dental Implants: A Guide for the General Practitioner

by Michael Norton

1995, Quintessence Publishing Co., Ltd.; 148 pages, 136 illustrations (118 color); $68 (US)
ISBN: 1-85097-037-8

As the title implies, this short text is aimed at introducing implant dentistry to general practitioners. An introductory publication about oral implants will inevitably suffer from the limitations of its intent; anyone who reads it and wishes to perform implant dentistry will require further information and education than is provided in the text. Nevertheless, such books can perform a valuable service in providing a sound scientific basis which is applicable across all osseointegrated systems, and which is often lacking in manufacturers' continuing education programs.

The author sets three objectives in his preface, namely: to provide fundamentals for oral implant treatment planning; to introduce the basics of implant surgery; and to "create a basic awareness of the requirements for prescribing implant supported prostheses." There is no doubt that he achieves his goals, but it should be asked whether these objectives have already been met by other books in this field. One text that comes to mind was recently reviewed in the *Journal* — Worthington, P., Lang, B.R. and LaVelle, W.E., *Osseointegration in Dentistry: An Introduction*, reviewed by Dr. George Zarb, *J Can Dent Assoc* 61:74, 1995.

While Norton's book is supported by more clinical photographs, it uses outdated prosthodontic terminology, at least by North American standards, (e.g. "bite registration," "bridge," and "suck down splint"), and refers primarily to one implant company (Astra Tech), for which Norton is a consultant. The Worthington text is more generic in content and is current in its prosthodontic terminology, but less specific about individual techniques. This may actually be seen as an advantage, since more detail will be required by readers of either publication. The contributions of several different authors to the Worthington text also add to its objectivity and, given the explosion of information in the field of oral implants, it is difficult for a single author such as Norton to provide the most accurate, up-to-date information in all areas.

Either of these texts may be considered by university dental faculties for use as an undergraduate reference text or by general dentists who want to find out what all the implant hoopla is about and whether it is a modality they wish to employ in their practice. The book by Worthington et al, however, provides a better overview of the science and rationale behind the applications of oral implants in fewer pages, while Norton's text has more photographs and is more technique specific. Your choice, Doctor.

Reviewed by:

Joanne N. Walton, CD, DDS, Cert. Pros., FRCD(C)
Assistant professor in the division of prosthodontics, University of British Columbia, Vancouver, B.C.

Bell's Orofacial Pains, 5th edition

by Jeffrey P. Okeson

1995, Quintessence Publishing Co. Inc.; 500 pages, 280 b&w illustrations, $68 (US)
ISBN: 0-86715-293-1

As in previous editions, this book is divided into three sections. The first is devoted to a review of neuro-anatomy and physiology, the second to clinical considerations of orofacial pains, and the third, and longest, to clinical pain syndromes.

Although it is common practice in clinical dental textbooks to start with a review of the relevant underlying basic science, the value of including such material is questionable as the information is readily available in appropriate basic science books which are usually written by authors more familiar and knowledgeable with the subject material than are clinicians.

The order of presentation of the material has been greatly changed from the 4th edition by Dr. W.E. Bell, but examination of the text reveals that much of it is taken verbatim from the 4th edition; so, there is much less new or rewritten content than would appear at first glance.

Previous editions featured a list of 35 clinical cases seen by Dr. Bell. This list is included in the present edition, but with some changes — which hardly seems proper — and without attribution to Dr. Bell, whose name and practice address have been removed from the headings. A few cases, perhaps five, appear to have been substituted by the present author.

Nearly every possible cause of oral pain is discussed, from pizza burns to space infections, pulpitis, temporo-mandibular joint pain and the facial neuralgias. Understandably, the author is better informed on some of these causes than he is on others. However, there are many omissions, particularly in the chapter on pain of mucosal origin.

Much emphasis is laid on joint and muscle pain, and the illustrations — from Travel and Simons (1983) book on myofascial pain — that show patterns of pain referral from "trigger points" in muscle are, again, reproduced in full. The validity of these diagrams is dubious in this reviewer's opinion, and they have had no validation from scientific research.

In any book that is intended to be used primarily as an aid in diagnoses and treatment, the distinctive clinical features of each of the conditions discussed should be presented fully, clearly and preferably in tabular fashion. Regrettably, this book only provides such information for some of the condi-

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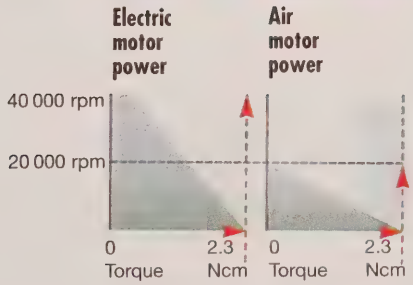

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tions that are covered. It could be criticized, as have previous editions, as being too discursive, repetitive and poorly focused, and it would provide little assistance to a practitioner faced with having to diagnose a puzzling case of facial pain.

There are golden nuggets of information to be found — such as the attribution of burning mouth or tongue, to tongue rubbing habits — but these are rather difficult to find in the 500 pages. There is also one rather serious omission: none of the five indexed descriptions of glosso-pharyngeal neuralgia refers to the fact that this condition is often due to a malignant tumor, deeply sited in the base of the tongue.

To be fair the subject is difficult and complicated, but the impression conveyed is that the author has not completely mastered it. It is difficult to make an overall judgment on the book. It contains a great deal of useful information, but it is written as if there are always alternative diagnoses to be considered, no matter the clinical features presented, and always alternative treatments to be contemplated, even when a diagnosis has been made and therapy is to be directed toward its cure or amelioration.

Reviewed by:

J.H.P. Main, BDS, PhD, FDSRCS, FRC (Path.), FRCD(C)
Professor and head of the department of oral pathology, University of Toronto, Toronto, Ontario.

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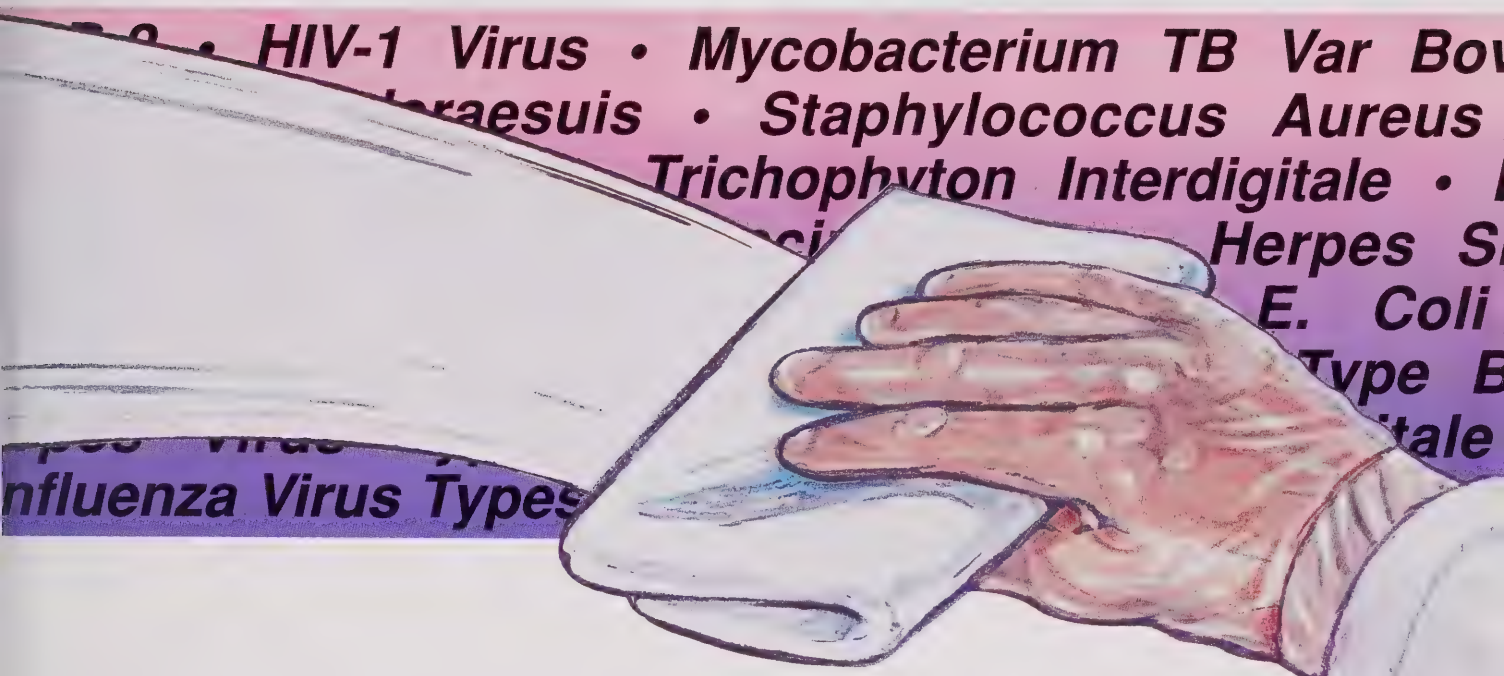

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References:

1 Data on file.

2 Block, Seymour S. Disinfection, Sterilization and Preservation. Fourth Edition, 1991.

3,4 ADA Council on Dental Therapeutics. Acceptance of (Synthetic Phenol) disinfectant for instruments and equipment. JADA 110:394, 1985.

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1. Overholser CD et al. Comparative effects of two chemotherapeutic mouthrinses on the development of supragingival dental plaque and gingivitis. *J Clin Periodontol* 1990;17:575-579
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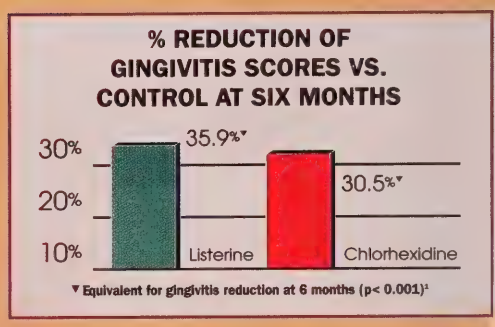

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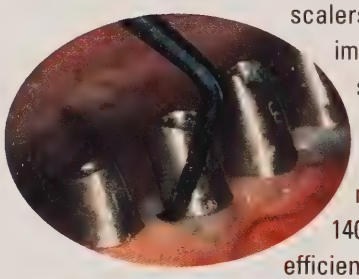

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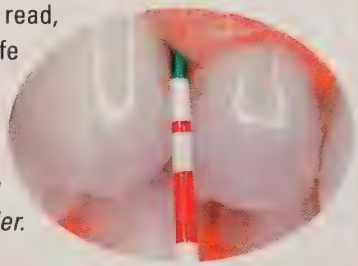

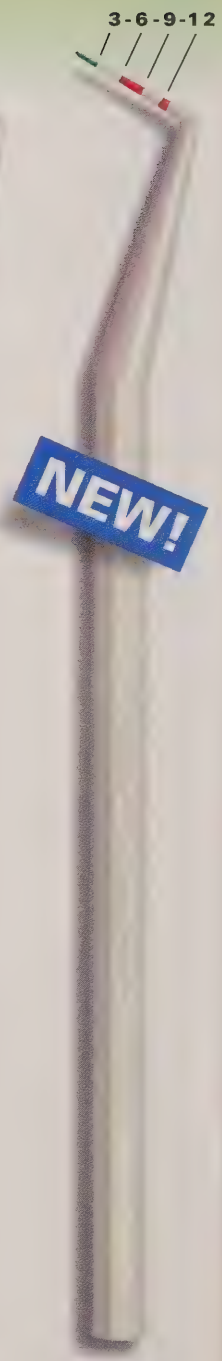

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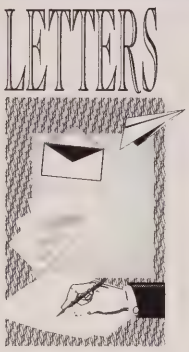

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On behalf of the 5,000 dietitians across Canada, I would like to commend you on your support of the Canadian Dietetic Association's 1996 national nutrition month campaign. Dietitians are committed to health for all Canadians through improved nutrition and food choices. Your inclusion of a guest editorial on nutrition which highlights the Nutrition Month theme and the reproduction of the campaign art and sponsor logos is greatly appreciated.

Lise Smedmor, RD
National Nutrition Month Coordinator

Denturists

We must take issue with at least 18 points of myth, half truths, innuendo and unfounded inferences toward denturism enumerated by Dr. Morley S. Rubinoff in his guest editorial, "Denturism — Is the Public at Risk," published in the February issue of the *CDA Journal* (Vol. 62, No. 2, p. 167, 1996). Dentists who do not choose to do denture work usually make that decision based on the fact that they feel ill-equipped to handle the job due to a lack of adequate training.

Earlier this year, the Denturist Association of Canada (DAC) wrote to Dr. Rubinoff in response to articles written by Dr. Rubinoff and Dr. Stevenson-Moore entitled, "On the Road Again," and "Specialty Presidents Meet with CDA," which were published in the Association of Prosthodontists (APC) journal. In those articles, which were based on Dr. Stevenson-Moore's presentation as a representative of APC, it is suggested that APC and the Canadian Dental Association (CDA) would like to invite representatives of DAC to meet with them and discuss their concerns about standards of care and scopes of practice. Although we had not been formally invited, our letter to Dr. Rubinoff, which was never dignified with a response, stated that we would be happy to meet with APC/CDA at any time if it would be beneficial in diffusing those myths which may be harbored on both sides and ensure the best possible denture care for the Canadian public.

We thought that the aforementioned articles by Drs. Rubinoff and Stevenson-Moore were an opening to broach the area of mutual denture care for Canadians, but since those articles, Dr. Rubinoff's editorial is an affront to the Canadian denturist profession and clearly states his, and possibly your, true feelings towards denturism, relegating previous articles to mere lip service.

The CDA's concept of a guest editorial comes into question as well, as we do not see a guest editorial as being the place for slandering an entire profession, with CDA's obvious permission.

Dr. Rubinoff states that we are not professionally trained, criticizes the Canadian community college system, calls us a risk factor, says we can't talk to oral surgeons and periodontists professionally, that our skills in removable dentures are less than those of dentists, as well as making many more statements, which are all untrue.

Canadian denturists are denture specialists in the truest sense of the word. We specifically study the subject of removable dentures. Our training in removable dentures is approximately 2,000 hours as opposed to students of dentistry who spend approximately 75 to 100 hours in the same subject area. Denturists have been legalized in Canada for nearly 40 years, and have never had a successful malpractice suit incurred on the profession. The name denturist is the recognized legal name for our profession in every province and territory in Canada. We are more skilled and better trained in removable dentures than general dentists, and have as much or more training in geriatric dentistry as dentists. Denturists are trained to recognize and refer. We do not diagnose what we cannot treat. All denturists, since the late 1980s, as well as most denturists prior to that time, are college graduates from recognized colleges of denturism, accredited by provincial governments. Dr. Rubinoff seems to feel that he should tell oral surgeons and periodontists who they should assist and/or refer to, a dangerous assumption to say the least.

It is time for organized dentistry to realize that denturism is here to stay, and if you are truly interested in the Canadian public, as you profess to be, then Dr. Rubinoff's thinking is a thinking of the past.

Let's stop the nonsense and get down to some serious dialogue that will allow Canada to continue to be the leading edge in dental/denture care.

Austin J. Carbone, B.Sc., B.Ed., DD
President, Denturist Association of Canada

As president of the College of Denturists of Ontario, I am regularly invited to attend council meetings of the Royal College of Dental Surgeons of Ontario, invitations which promote harmony and co-operation between the two professions, and which are viewed as a positive approach toward eliminating the remnants of an animosity which has existed for too long in this country.

Dr. Rubinoff's negative attitude is conspicuous in this atmosphere of detente, and therefore provokes a response from one who has worked long and hard for that detente.

Denturists in Ontario graduate from a three-year course of study which is dedicated entirely to denture fabrication and fitting, along with the related sciences — many of our registrants hold a B.Sc. degree, acquired before embarking on their denturist studies. In addition, continuing education courses complement this training on an ongoing basis. Also, it is worth mentioning that implant companies whose courses at one time were exclusively for dentists, now recognize that denturists are an integral part of the implant team, and that they will not compromise the high standards set by such companies.

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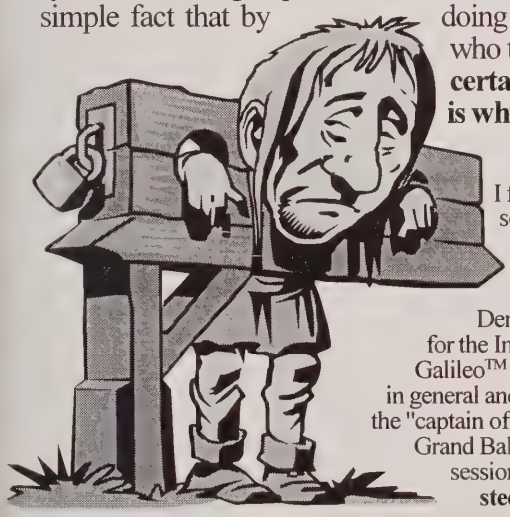

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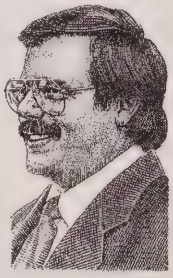

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Peter Letterese
Chairman and Founder

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The matter of referrals is a two-way street, denturists refer patients to dentists for preventative and restorative dental work and dentists refer denture patients to denturists.

Dr. Rubinoff and his prosthodontist colleagues may not feel the benefit of such referrals, although it is evident that they feel the impact, but they must surely be aware that a significant portion of the general dentist's practice is preventive and restorative work.

With respect to the old argument of "risk of harm," this did not wash with the Schwartz review of the Ontario health professions legislation, which acknowledged our qualifications, nor did it convince the public that their dental health was at risk.

It seems from Dr. Rubinoff's editorial that prosthodontists are not enjoying as large a piece of the denture pie as they would like. Denturists, on the other hand, are flourishing because their profession is founded on the basis of providing a high quality, personalized service at reasonable cost to the patient.

I note with interest Dr. Rubinoff's curious exhortation to his colleagues to "take back our profession" by curtailing the ambitions of denturists through educating the legislators and the public. Too late, Dr. Rubinoff.

We would urge Dr. Rubinoff's colleagues across Canada to elect another president of their association, one who really does have the best interests of the patient in mind, and who is prepared to work in cooperation and harmony with other health care professions.

Mordey J. Shuhendler, DD, RDT
President, College of Denturists of Ontario

I am responding to the guest editorial by Dr. Morley Rubinoff, published in the February 1996 issue of the *Journal Of the Canadian Dental Association*, and also to a letter, dated March 15, 1996, from Mr. Austin Carbone, president of the Denturist Association of Canada.

I personally have a similar view to Dr. Rubinoff, and reviewed his article prior to its publication. I cannot think of one individual prosthodontist in this country who is better equipped to deal with this contentious issue than Dr. Rubinoff, and we applaud him on his determination and stamina to make progress in this difficult area.

Several untrue statements were made by Mr. Carbone in his letter (page 278). First, he states that "dentists who do not choose to do denture work usually make that decision based on the fact they feel ill-equipped to handle the job due to a lack of adequate training." I challenge Mr. Carbone to back this claim with actual scientific research with accompanying references. In fact, it would be interesting for the Canadian Dental Association to commission a study to answer this very question.

I believe the *CDA Journal's* guest editorial page is the appropriate place for such a question to be asked. It deals with the health of the public at large, across the country, and also with the practice of providing prostheses to patients, which is within the definition of a dentist. Mr. Carbone seems offended that such a question is, in his words, "slandering an entire profession." I do not view this as a slandering comment. Denturism has never been listed as a profession in any reference, manual, or dictionary. By utilizing the definitions of what a profession is, denturism falls short in several areas. It could be referred to as an "occupation" or a "trade," hence its location in "vocational" or "trade" schools.

Continuing with the definition of a profession then, denturists are trained by their peers, and since we do not view denturists as professionals, they cannot be professionally trained. The argument with regard to the numbers of hours of training of a denturist versus a dentist is old news. There is a significant difference in training where hours are delegated to simple repetition of technical steps versus a formal training program in an academic setting. I do take some concern with the fact the denturists claim to be "more skilled and better trained in removable dentures than general dentists" and have "as much or more training in geriatric dentistry than general dentists." I am not aware of any denturists on faculty at the University of Alberta, for example, or of any who are aware of the dental curriculum and can make these type of statements.

A further statement, "we do not diagnose what we cannot treat," typifies the argument of the denturist and the concern of all those who recognize the problems with denturists. Diagnosis of a problem does not require the knowledge and ability to provide treatment, but it does require knowledge of normal and abnormal anatomy, physiology, psychology, biochemistry, pathology, radiology, the functional aspects of speech, deglutition, and mastication, to name a few of the disciplines that a dentist draws from his or her knowledge base. Dentists state that: "The perpetual preservation of what is remaining is more important than the meticulous restoration of what is missing" (M.M. Devan), and this is why the specialized knowledge of a dentist is required.

It does appear for the time being that "denturism" is for the present time here. However, the dental profession as a whole needs to re-evaluate denturism firsthand to ensure that these individuals provide care for patients within the parameters of care of dentists and prosthodontists. I personally feel that denturists could have a closer relationship with dentists and prosthodontists by limiting themselves to areas where they have had training, and working cooperatively within the dental practice.

A long-standing member of the profession once stated: "Everybody wants to be a dentist, but few want to go to dental school." This seems to be a continuation of that attitude. Until denturists agree to carry malpractice insurance, practise acceptable sterilization and disinfection methods, and provide diagnosis and treatment for patients within the parameters of care of dentists, in particular prosthodontists, they will be viewed as auxiliaries. The real concern is that the public is being led to believe that denturists are "denture specialists." While they may view themselves as this, the real fact is that they are the least trained individuals allowed to provide this service directly to the public in Canada. At times, when even tow truck operators call themselves "Doctor Hook," it is difficult to distinguish what a professional, a profession, and even a specialist is.

I applaud the efforts of CDA president Dr. James Brookfield and the Canadian Dental Association in mustering the courage to address this long-standing unresolved and neglected issue.

Brian K.S. Kucey, B.Sc., DDS, MS.Ed., FRCD(C)
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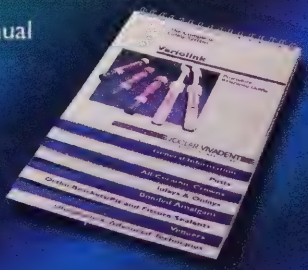

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Two denturists, the presidents of the College of Denturists of Ontario and the Denturist Association of Canada, no less, have felt it necessary to respond to a guest editorial published in the February 1996 issue of the *CDA Journal*. The editorial was written by another president, Dr. Morley Rubinoff, of the Association of Prosthodontists of Canada, whom Mr. Shuhendler believes we should replace. I am pleased to be able to inform Mr. Shuhendler that the electoral process remains as intact in the dental profession as in any other part of our democratic society. Should he wish to run for office in the Association of Prosthodontists of Canada, he need only qualify first as a dentist, and then as a prosthodontist, and he would be most welcome to allow his name to stand in nomination for the post. While we await Mr. Shuhendler's nomination, the members of the Association remain very comfortable with Dr. Rubinoff's presidency.

Mr. Carbone seems to feel that no discussion of issues pertaining to the practise of dentistry should be allowed, and that no criticism of his trade, or of our profession, should be allowed in any forum. Canadian prosthodontists may not yet be ready to meet with Canadian denturists, though our American colleagues are interested in such an encounter. Nonetheless, I am sure that both Mr. Shuhendler and Mr. Carbone would agree that any discussion that promotes the health and safety of members of the public is worthwhile, and that they did not mean to deny freedom of speech to any individual who felt the need to express an opinion. They are presumptuous to suppose that Dr. Rubinoff's views do not have adherents, but must, I suppose, be excused, as their letters make it apparent that they do not know what they do not know.

Indeed, Mr. Shuhendler and Mr. Carbone seem more than a little confused in a number of areas. They should realize that not only can they "not diagnose what they cannot treat," but that if they cannot recognize it, they cannot diagnose it in the first place, let alone refer it!

Degree or no degree, Mr. Shuhendler and Mr. Carbone's correspondence misses the point of Dr. Rubinoff's editorial contribution. The thrust of his discussion is directed toward a review of dentistry's role in these matters. Why would dentistry not get its own house in order before attempting to sort out someone else's?

Mr. Shuhendler and Mr. Carbone seem to feel that a degree is an important prerequisite to a program of training. Could they not be encouraged to consider a dental degree as being most appropriate to the practise of dentistry. If it took 2,000 hours of training to equip denturists to construct complete dentures, how many more hours will be required to achieve an adequate standard of practice in the planning, construction and delivery of partial dentures and implant supported dentures? What do they believe dental students to be doing during four years of training, let alone the 75 hours postulated for denture instruction? And while community college programs of accreditation remain unsupported by the dental or any other health care profession, who is to say when enough training is enough?

Like it or not, denturists do not have an unblemished practice record, any more than do dentists, and they would do well not to stand on a reputation of being "holier than thou." Mr. Carbone's claim that denturists are better trained in removable dentures than dentists is an opinion that will not stand up to critical analysis. On the other hand, I am happy to acknowledge that I have seen the occasional complete denture restoration performed by a denturist that would more than satisfy any dentist. Unfortunately, there are denturists and dentists who are occasionally less successful in their pursuit of excellence.

In British Columbia, difficulties have been encountered in phrasing legislation, and in developing standards of practice, that will allow dentists and denturists to work together. The Danish model may well represent a very practical approach to the resolution of the differences that exist. One should not underestimate the development work that will be necessary to make this objective attainable.

In the past, denturists have not been recognized for their ability to read and follow the law, which has not inspired confidence in the members of the dental profession. It remains to be seen whether an improved working relationship can be developed between these two groups, and whether an expansion of the scope of practice by denturists can be sustained without the support of dentists.

In raising the issues that he has, Dr. Rubinoff may not have been too late, he may only have been just in time.

Peter Stevenson-Moore, BDS, MSD, MRCDC
Vancouver, British Columbia

Ancillary Dental Personnel

Twenty-five years or so ago there was a group of ancillary dental personnel lobbying with governments for the right to treat the public directly. They pointed out that they could perform their duties at a great saving and could do it more quickly without going through the dental office. They argued that dentists already entrusted some of them with the performance of their tasks and that there was very little instruction given or supervision required. They told the politicians that even though they were illegal, they had been providing the services for quite some time with no complaints from patients. They did admit to having no regulatory association, but said they would get one if their activities were legalized. Of course, I am referring to denturists.

At the time, we dentists argued that denturists had no formal training, were illegal, had no regulatory body, would expand their scope of practice, and should not be treating the public directly. We all know what happened. They convinced the legislators and the public, and we all know what they are up to now.

Today there is another ancillary dental group that is saying they should be able to treat the public directly without supervision. They say that they will do it for less money and will offer more comprehensive caring practice because they are doing it now. They say they are the real professionals in the delivery of these services, because they already do it without much direction or supervision by the dentists. They say the patients never complain. They seek self-regulation, will police themselves and say

they will be able to treat many more people that now can't access affordable dental care.

Does this sound familiar? More frightening is the fact that all the arguments we used the last time, when we lost, are not even valid on this occasion. Dental hygienists are fully trained in the duties they now perform, they have recognized licensing bodies, and they are doing all they say they want to do legally.

The sad thing I have come to realize on discussing these facts with the hygienists in our office and with others we have worked with over the years, is that possibly the motivation for some of these people is the desire for independence. That desire in itself is not particularly harmful, except for the potential consequences both to dentistry and to our patients once the split has occurred. More disturbing to me is the fact that perhaps the majority of dental hygienists in this country are content as they are, and long only for the recognition they deserve.

In the dental family, I liken the situation to a teen who longs for independence and leaves home. Of course, he or she cannot survive without third-party involvement, both for income and advice, either from a government agency or a sympathetic outside party. If this is provided, they may get along not too badly except that all the good things that the rest of the family provides are not available, and the consequences may have to be endured. Unfortunately, the rest of the family and the people that rely on the family unit will also be adversely affected.

Surely there is some solution that will make the prodigal return home, hopefully to the security and happiness of the total family unit, as it was designed. Surely there is some solution to the dilemma aside from the breakup of the family and the dissolution of a working unit that has served the public very well for over 30 years.

I do feel a certain responsibility, as my father, in the early 1970s, had the first private practice in Canada that utilized expanded-duty dental hygienists (as part of the original pilot feasibility study). At that time, the team concept was developed to allow greatly overworked dentists to manage the tremendous treatment needs of their patients. The project was very successful as, in the true sense of a profession, we always try to put ourselves out of business by eliminating the need for our services. We should be extremely proud of our accomplishments and remember that it was the entire dental "family" that was responsible. I do not want to see my family broken up, and those that wish this must be told in no uncertain terms that the rest of us won't stand for it.

Brian D. Barrett, DDS
Executive Director, Dental Association of Prince Edward Island.

Promotional Flyers

A promotional flyer from a dentist's office recently came into my possession. In it the dentist offers a $25 discount on a future hygiene visit to anyone who refers a new patient to the dental practice. Having spent a lifetime in dentistry and known so many upright decent, able, conscientious dentists, it saddens me to see such promotional ventures. These actions demean our profession and cast a slur on the great majority who serve the public and profession well.

In our world, where so many health services are provided "free," dentistry already labors under a load of resentment, as patients must pay for it out of their own pockets. I feel that if such practices as coupon discounts were to become prevalent, then that cloud of resentment will with time deservedly blacken.

Wallace F. Walford, DDS
(McGill 1938)
Perth, Ontario.

The Dental Interview

I write in reference to an article which appeared in the *Globe & Mail* on March 21, 1996, entitled "Fluoride has dentists frowning." For anyone who missed this front-page story in Canada's national newspaper, it was yet another example of the poor image of the dental profession that is constantly being relayed to the public by the media. It painted dentistry in decline and dentists in a desperate light — a health profession that now stoops to luring patients in through the door with everything from free popcorn to aroma therapy, seniors' discounts and reggae music in the operatory.

I would guess that most of the dentists who gave an interview for the article shook their heads in dismay when they saw it in print, and said, "This was taken out of context!" But that is what a good many reporters do. It's their job. George Bain, himself a journalist with over 17 years experience as a member of the National Press Gallery, provides details in his book *Gotcha!* of what a journalist really does: "... journalists are not in the business of picking up messages here and unquestionably delivering them there like Canada Post. They select, from the tens of thousands available each day, those messages they decide their readers or viewers should have. Then they decide how the information should be interpreted — in what words and with what playing-up of this aspect at the expense of that. Then, if the message contains both good guys and bad guys, which is very often the case, they decide which are which." This should give dentists an idea of who's in control of the final product of a media interview.

So what should a dentist do, when contacted by a media outlet to act as a source? Does this mean all interviews should be declined? Not necessarily. The key is being prepared. It is not out of the question to ask the reporter a few things prior to giving an interview. What, specifically, will the story be about? Who else will be interviewed for the story? Can the questions be reviewed prior to granting the interview? Remember, the CDA and most provincial dental associations/societies have trained spokespersons available. Referring an interview to these organizations is always the best bet when the topic is a bit fuzzy in its definition, or out of one's specific realm.

The final word on media stories like "Fluoride has dentists frowning" is that careless or seemingly-innocent comments made by the dental profession do much to play into the hands of those who aim to portray dentists in an unflattering light. They make the job of organized dentistry, as it attempts to paint the dentist as a capable health-care professional, that much more difficult. I would advise dentists everywhere to approach the opportunity of giving a media interview with a certain amount of caution.

Steve Jennex, APR
Communications director,
Nova Scotia Dental Association.

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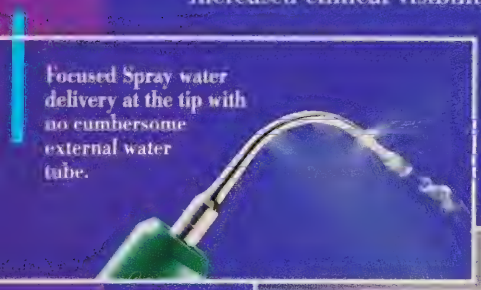

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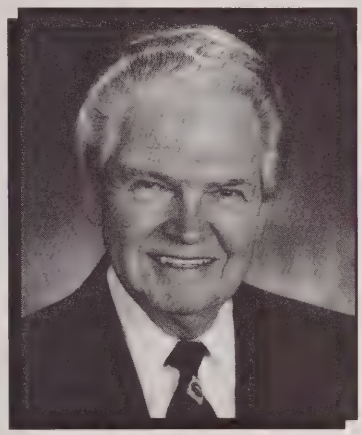
EDITORIAL

LIVING TOGETHER FOR BETTER OR FOR WORSE



Dr. P. Ralph Crawford, Editor

Back in early March, with winter still firmly entrenched in Canada, and chilling winds from the North reminding my wife and me that Ottawa is the coldest capital city in the world, we took advantage of a $199 airline seat sale and escaped for a short vacation in Bermuda.

One of the highlights of our trip was a visit to a small but well appointed aquarium. Although the fish were fascinating in their own right, what really caught my eye was the ability of a teacher who was busily guiding her flock of 12 neatly uniformed primary school children from one exhibit to another. The respect this individual received from her charges was something to see. She was clearly an excellent teacher, with a special aptitude for making her class's extramural outing both an adventure and a learning opportunity.

The teacher stopped at one particular display a little longer than others — judging, or so I imagined, that it offered her a great opportunity to impart some basic lessons of life to the children. Entitled "Living Together For Better Or For Worse," the display showed how creatures living in the sea surrounding Bermuda share a life of parasitism, mutualism and commensalism. These are heavy words for grade-ones, but the teacher patiently explained their meaning in language her charges could understand.

By this time there were as many adults in the teacher's audience as children, and I believe we all gained something from her object lesson in lifestyle. We heard that one partner in a parasitic relationship, the host organism, is harmed, while the other partner, the parasite, reaps all the advantages. It was no easy task for the teacher to impart to the children that, while parasitism is an accepted way of survival for creatures living below the sea and in the forest, it is unacceptable in human society. But the nodding of tiny heads and the shining comprehension in bright eyes indicated understanding.

Mutualism was the next big word. Again, the teacher's object lesson of how both partners benefit and flourish from a symbiotic relationship didn't escape any of us. Commensalism was more difficult to explain. Aided by the descriptive script over the aquatic display, the teacher said that commensalism was like sharing food at the table. It exists when one partner in a relationship benefits, but without causing any suffering, harm, or disadvantage to the other partner.

This delightful episode was forgotten until weeks later, when I received two distressing telephone calls. They were from recent dental graduates seeking information on how to deal with associateships that had gone badly. In both instances, the dentists had entered into agreements with senior dentists innocently believing that the relationship would be mutualistic at best, or involve a tolerable degree of commensalism at worst. Unfortunately, both senior dentists were parasites.

I found myself getting angry as I heard a tangled web of legal agreements, covenants, conflicts of interest, opportunism and crass greed. Because I didn't have both sides of the story, at this point all I did was listen. Later, however, I made some casual inquiries of a number of provincial registrars. The four registrars I spoke to confirmed that a certain number of associateships fall apart each year. And each registrar agreed that some of the saddest cases typically involve new graduates, who ostensibly have been treated shabbily by senior dentists.

Interestingly, none of the registrars could offer a solution to prevent these types of cases from recurring. Each indicated that most associateship problems can be prevented if both parties seek appropriate counselling prior to signing the final agreement. But each registrar also admitted that once an associateship has degenerated to the name-calling and legal-wrangling stage, it is a case for the civil courts, not the licensing authority.

These are difficult times in dentistry — particularly for young dentists beginning a career. The very thought of an established dentist taking advantage of the situation is unconscionable. Even if incidents of this type are rare, they are unethical, unbusinesslike and possibly illegal.

Our dental faculties must provide new graduates with the knowledge they need to cope in a world that is not always mutualistic. Dental associations and dental licensing authorities have a responsibility to provide opportunities for new graduates to learn how to discern a good associateship from a bad one. We can't continue to rely on commercial entrepreneurs to fulfil this role. Some things are best done by the profession itself.

This is why I am such a strong supporter of CDA's new dentist committee. Working through the committee, young dentists help young dentists. Perhaps the new dentist committee should be given a special mandate to not only assist in associate disputes between new graduates and senior dentists, but also to establish a working mechanism to help prevent parasitism from ever beginning.

Like it or not, it is not a perfect world, and we dentists must learn to live together for better and for worse.

P. Ralph Crawford, BA, DMD
Editor of the Journal of the Canadian Dental Association

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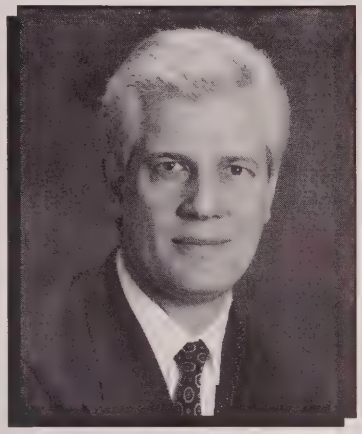

Dr. James R. Brookfield, CDA president.

Those of us who still consider managed care to be an American phenomenon that only exists south of the border had better think again.

In March, spurred on by their inability to convince dentists that their products should be widely incorporated into the dental office armamentarium, the manufacturer of Chlorzoin, Caries Screen and the Bana Test launched The Oralife Group and began selling shares on the Toronto stock market.

Oralife, by its own description, is "a managed health care company focused on providing preventive care solutions that significantly reduce the long-term costs of dental care." In effect, the company plans to sell its diagnostic and prevention products directly to insurance companies, third-party administrators and managed-care organizations.

In its preliminary prospectus, dated January 30, 1996, Oralife also suggests that the key to managing the costs of dental plans is managing dentists. To do this, it has developed "proprietary treatment plans" that set out specific procedures and guidelines for patient selection, patient diagnosis, and patient treatment. These plans have been "embodied" in a new computer software program called "Guaranteed Outcomes" or "GO," which will be "used by Oralife independently or in concert with insurance companies and managed care organizations in connection with the reimbursement of dentists for their services."

The GO software is also intended to allow Oralife, through its professional services division, to carry out "proactive monitoring of dentists" and to set "professional standards of care to evaluate targeting of prevention and professional compliance."

According to the company's prospectus, Oralife believes that managing dental care means "managing the disease and managing and educating the dentist." To that end, Oralife plans to establish a network of "recommended providers." Each participating dentist will be supplied with GO software to guide them "concerning the reimbursement of appropriate care," and to allow Oralife to analyze treatment results "so as to refine treatment planning and cost effectiveness."

Another section of the prospectus on disease management, entitled "Monitoring of Dentists," explains that GO software "will permit an insurance carrier to recognize many of the benefits of a PPO (preferred provider organization) without the investment, time commitment or limits on savings...," as well as allowing "insurers to reward the dentist for appropriate care and to monitor this care against professional standards."

Similarly, the section of the prospectus entitled "Analysis of Treatment Results For Improved Treatment Planning" states that GO software will position Oralife "to become a depository for dental treatment planning and results information," which "will permit the company to fine tune its guidelines for reimbursement and to integrate new dental treatment technologies which are introduced by its pharmaceuticals division..."

Three principles are at stake here.

First, the Oralife strategy flies in the face of the dental profession's right of self regulation. Only the 10 provincial licensing bodies have the legislative authority to enforce standards of care. And while individual third-party carriers may internally audit any dentist who signs a claims form on behalf of a patient covered under the carrier's dental plan (providing patient permission has been obtained), they have no disciplinary authority. Other than reporting cases of wrong doing to the appropriate provincial licensing body, the carrier's only alternative is to take the matter to the courts and attempt to have an offending dentist charged with fraud.

Second, only dentists have the clinical knowledge, training and experience to differentially diagnose and treat oral health conditions. To suggest that treatment planning belongs in the sphere of managed care providers, or that drug manufacturers should be allowed to engage in treatment planning, is frankly offensive. Worse still, Oralife plans to computerize its treatment plans and market them as a cost containment service. This is wrong. Treatment plans must be based on need, not cost. And patients must be advised of all the available treatment options, informed of the advantages, disadvantages and risks of each one, and allowed to choose the treatment plan that best suits their dental health and budget.

Third, patients must retain the right to attend a dentist of their choice for treatment at a standard the patient can select. By attempting to establish a preferred provider network, and through its aggressive marketing efforts to the "payors" of dental care, Oralife is effectively limiting many patients' access to dental care at a standard of the patient's choice. This, too, is wrong.

But neither Oralife's past losses nor the obvious problems with its managed care approach have put a damper on the demand for the company's initial stock offering of 3,722,811 common shares. As of March 22, the offering was already oversubscribed, with shares selling at $7.25 each.

In the end, however, it will be up to individual dentists and the profession to decide if Oralife and other managed care companies gain a foothold in Canada. If we collectively refuse to participate in managed care schemes, they will die. And if we, as a profession, are successful in convincing both employers and the Canadian public that there is value in dentistry, managed care will never come back. This is what CDA's new Public Education Program is all about, and why I believe it is one of the most important initiatives that we have ever undertaken on behalf of Canadian dentists.

James R. Brookfield, DDS
President of the Canadian Dental Association

Is Your Whole Family Benefiting From CDSPI's Family Of Plans?

You see the words "dentists" and "dental" in everything Canadian Dental Service Plans Inc. (CDSPI) offers: from the Canadian Dentists' Insurance Program and the Canadian Dental Association Retirement Savings Plan, to the Canadian Dental Association Retirement Income Fund.

But in many cases, taking care of dentists also means taking care of dentists' families. When you look at our plans that offer family coverage, you'll generally find that they provide better value and more benefits for your spouse and children than you're likely to find in other products in the marketplace.

Many dentists are already convinced of the advantages of our program. About one-third of the dentists who participate in the basic life insurance plan also insure their spouse under dependents' life insurance. About one-quarter of the dentists who participate in the accidental death and dismemberment plan also insure their family under the available family coverage. And in the case of both hospital cash insurance and travel insurance, about twice as many dentists have chosen family coverage over individual coverage.

The investment side tells the same story. Almost one-third of all CDA RSP participants are the spouses and children of dentists.

A Plan-By-Plan Look

When you take a plan-by-plan look at the ways you can use CDSPI's insurance and investment programs to help protect and provide for your family members' total financial security, it's easy to see why so many dentists are participating.

For example, although people who are their family's main or sole income earner may see no reason to invest in life insurance for a spouse, there's a good reason why a third of the dentists who have life insurance through our plans also choose dependents' life insurance to cover a spouse.

It's easy to understand when you stop to figure out what the financial consequences would be if you were on your own, without your spouse. If your spouse earns an income, then your need for this coverage is obvious: you would require the insurance benefit to maintain your standard of living. But even if your spouse doesn't earn an income, there may still be reason to purchase this coverage. For example, you may need the money to cover day care expenses if you have young children at home.

Another important plan to consider is accidental death and dismemberment insurance. It's easy to think that this coverage is only critical to the dentist and not to the rest of the family, since a serious accident could limit — or end — a dental career. But it's just as likely that your spouse or children could suffer a serious accident, and a lump sum payment can help you to cope with the consequences of a serious injury.

Choosing the accidental death and dismemberment plan's family coverage can be an easy decision. No medicals are required and coverage is economical. Adding your family to this plan — at the maximum coverage level — would cost just over $55 a year (based on the 1996 annual premium).

Hospital cash insurance, a relatively recent addition to our program, covers the expenses involved with hospitalization that provincial health plans don't cover. For example, semiprivate rooms, travel costs for loved ones, treatment in another country, and even helping to offset lost income if you take a day off work to make a hospital visit. The plan also makes lump sum payments for debilitating illnesses and conditions, such as heart attack, stroke and cancer. (If you have an extended health care plan, you may not need all the benefits of this plan.)

The incidence of the various conditions that could lead you to need hospital cash insurance is higher than you may think. Nearly four in 10 Canadians will develop cancer, one in three will develop heart disease, and one in four will be disabled by an accident. Each year, one in 10 Canadians is hospitalized or spends time in a nursing facility. Obviously, these statistics take on more significance when you look at your family picture and not just your own situation. It's not surprising, then, that about twice as many dentists have family coverage than single coverage.

Travel insurance family coverage is also selected far more than individual coverage. One reason for this is the distinct advantage that this plan has over the travel insurance coverage provided by some credit card memberships. Often, credit card travel insurance doesn't cover the cardholder's family members when they travel

without the cardholder. It's important that you check your credit card's coverage in this area. Family travel insurance through CDSPI covers all eligible family members, regardless of whether they are travelling together or separately. You'll also find the price for family coverage to be among the lowest — if not the lowest — in the marketplace.

Your family and the CDA RSP

Most dentists know that they can join the CDA RSP if they belong to CDA or the Ontario Dental Association. And most know they can also use the plan to make their own contributions to a spousal RRSP. But did you know that an eligible dentist's spouse and children can join the CDA RSP on their own? Remember, children of any age can join — provided they have earned income. You may also want to pass the word along to your staff members. Your hygienists, dental assistants, and other employees can all open a CDA RSP. And their spouses can join too.

For all of these eligible participants, the CDA RSP may be their only opportunity to join an RRSP that has no service fees, no front-end loads, no back-end loads — no sales fees at all. The only cost is a low management fee of 1.45 per cent or less. Participants also benefit from the CDA RSP's strong performance, as shown below.

If you want to give more information about the CDA RSP to a family member or any eligible person, you can contact CDSPI and request the brochure, *CDA RSP: The Performance RRSP.* Just call an investment administrator at 1-800-561-9401, or (416) 296-9401 in Metro Toronto, extension 253 or 254.

It stands to reason that many of CDSPI's plans are among the best in the marketplace for dentists' family members. After all, CDSPI only offers plans that can provide an edge over other plans available to the public.

Give thought to the four plans that offer family coverage: dependents' life insurance, accidental death and dismemberment insurance, hospital cash insurance, and travel insurance. And tell your family about the CDA RSP. There is a good reason why so many dentists have made CDSPI's insurance and investment programs a family favorite. ■

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Aggressive Equity	✔ **23.2%**	20.5%	n/a		n/a		n/a	
Common Stock	**16.0%**	20.5%	**11.0%**	12.6%	**9.7%**	11.2%	✔ **8.9%**	7.9%
Balanced	✔ **15.8%**	13.9%	**9.8%**	9.8%	**9.6%**	9.7%	✔ **8.9%**	8.2%
Bond & Mortgage	✔ **12.5%**	11.6%	✔ **8.3%**	7.2%	✔ **10.0%**	9.3%	✔ **9.9%**	9.3%
Money Market	✔ **6.9%**	6.0%	✔ **5.6%**	5.0%	✔ **6.3%**	5.8%	✔ **8.2%**	7.7%
International Equity	✔ **22.6%**	12.8%	n/a		n/a		n/a	
European	✔ **23.6%**	12.8%	n/a		n/a		n/a	
Pacific Basin	✔ **23.2%**	12.8%	n/a		n/a		n/a	
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† *CDA figures indicate annual compound rate of return with all fees deducted. The figures are historic rates based on past performance and are not necessarily indicative of future performance.*

* *Comparison performance figures are Financial Post averages for the range of similar funds offered in the marketplace before sales charges, as published in the April 20, 1996 issue.*

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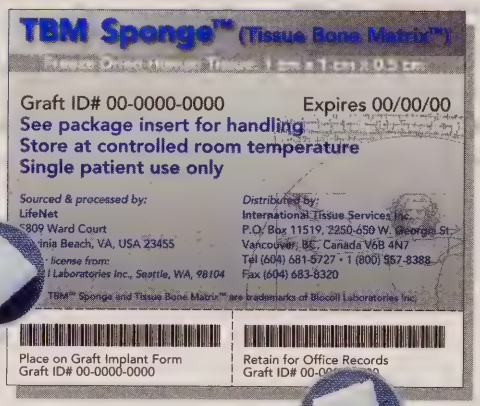

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NEWS UPDATE

CDA Seeks Health Forum Support For Moratorium On Changes To the Tax System

CDA brought its campaign against the taxation of employer-sponsored dental plans to a National Forum on Health stakeholders conference on Seeking Solutions To Health and Health Care April 19.

Represented by its president, Dr. James R. Brookfield, CDA sought the forum's support for a moratorium on ad hoc changes to the Canadian tax system. CDA believes the current tax-free status of health and dental plans should be maintained until and unless the federal government conducts a comprehensive review of the Canadian tax system and its impact on health-care delivery.

"We have mounted a public campaign against the taxation of employer-sponsored health and dental plans in each of the past three years. We believe that such a tax would have long-term negative health repercussions for all Canadians, and that it would ultimately reverse many of the oral health gains that we've achieved in Canada over the last 25 years," said Dr. Brookfield.

According to Finance Minister Paul Martin's 1996 *Economic and Fiscal Update*, a tax on health and dental plans could raise as much as $1.125 billion in new revenues for the cash-starved Canadian government. The down side is that it would also increase the annual tax bill of many Canadian families by as much as $1,200 per year.

Research conducted by Towers Perrin in Quebec suggests that many Canadians would opt out of their health and dental plans to avoid paying a premium tax, which would ultimately lead to the collapse of Canada's unique oral health care delivery system.

The National Forum on Health, which was established by Prime Minister Jean Chrétien in 1994, has a broad mandate to improve the health of Canadians, as well as the efficiency and effectiveness of Canada's health care services. During this process, it will also identify "national priorities" and ensure that "Canadians are involved and informed about the issues and the options."

"It's timely for us that the government is examining the broad picture with a view to establishing health and economic priorities," said Dr. Brookfield, "and it's an added bonus that the forum process has already articulated many of the points made by CDA during its three-year fight against the taxation of health and dental plan premiums."

One segment of the April 19 stakeholders' conference was focused on the public and private financing of Canada's health care delivery system. Full details on CDA's participation at the conference will be provided in the next issue of *Communiqué*. ■

Colorado Dentist Loses Amalgam Case

A Colorado dentist has been found guilty of violating the state's Dental Practice Act for promoting — and carrying out — the removal of serviceable amalgam restorations as a method of treating a wide range of diseases, including multiple sclerosis, Alzheimer's, lupus, and Crohn's disease.

In her decision, administrative law judge Nancy Connick ruled that the dentist, Dr. Hal Huggins of Colorado Springs, engaged in "deceptive advertising to entice patients to seek dental treatment for their serious medical problems, when in fact there is no known link between their teeth and general health or between the treatment offered and any improvement in their health."

Judge Connick's 71-page initial decision states that Dr. Huggins regularly removed his patients' dental amalgams, metallic crowns and bridges, and replaced them with composite restorations. He also extracted all teeth that had root canals. In fact, the same basic treatment was provided to all patients, using a standard protocol for treatment that Dr. Huggins developed in the 1980s, even if they were experiencing no problems with their dental amalgams, crowns, bridges or root canal teeth, and were asymptomatic.

"The diagnostic techniques and treatments offered by (Dr. Huggins) at the Huggins Center are scientifically unsupported, without clinical justification, and outside the practice of dentistry," stated Judge Connick. "The standard protocols which (Dr. Huggins) has developed thus provide care which does not meet generally accepted standards of dental practice and, in many cases, is grossly negligent...

"Given his steadfast and long standing commitment to his theories in the face of substantial reasoned evidence to the contrary, it is evident that nothing will stop Dr. Huggins from practising the treatments he has developed short of revocation of his licence to practise dentistry. Such disciplinary action is also justified by the multiple violations of the Dental Practice Act proven in this matter, especially those involving grossly negligent care.

"Accordingly, it is the initial decision of the administrative law judge that (Dr. Huggins') license to practice dentistry in the State of Colorado is revoked."

Full details of the Huggins' case will be provided in the next issue of *Communiqué*. ■

CDA Launches Public Education Program

CDA has launched a new public awareness program to promote the value of dentistry and preventive dental care.

Known as the CDA Public Education Program (CPEP), the new initiative will ensure that CDA is able to respond quickly and proactively to the issues confronting the dental profession, and that the necessary resources are in place to manage these issues effectively.

"What this program does is allow CDA to maintain the same level of public education activity that we built up during the 1994-95 "Enough is Enough" campaign against the taxation of dental benefits, and sustain it for the long haul," said Linda Teteruck, CDA's director of communications. "In effect, we have recognized in a formal way that issues management and public education will play an ever larger role in CDA's day-to-day activities, and we have created a mechanism to make this possible."

It is anticipated that much of the $360,000 budget allocated to CPEP in 1996 will be used to educate the public about the value of Canada's current system of oral health care delivery, including privately-funded third-party dental plans. ■

Federal Government Targets Self-Employed Canadians For Increased Audit Activity

Finance Minister Paul Martin hopes to raise as much as $150 million in new government revenue by targeting self-employed Canadians and unincorporated businesses for increased attention by Revenue Canada's auditors.

In his 1996 budget, Mr. Martin announced plans to devote more of the government's resources "to Revenue Canada's audit program for unincorporated businesses and self-employed individuals in order to increase the audit coverage for these groups and bring it more in line with the continued growth in this sector."

According to budget documents released March 6, 800 additional auditors will be devoted to the program in 1998-99 when it is fully in place. It will cost Canadians about $50 million per year to operate, for an expected annual net gain of $100 million. ■

Bite Mark Evidence

What's New

Recent changes to the Criminal Code of Canada, section 487.01, give authorities the right to issue a warrant to obtain dental impressions from suspects in cases involving bite-mark evidence.

Prior to the change, suspects could refuse to submit to this dental procedure. With it, the Criminal Code allows judges to issue a warrant authorizing a peace officer to "use any device or investigative technique or procedure or do any thing described in the warrant that would, if not authorized, constitute unreasonable search or seizure in respect to a person or a person's property."

Ironically, the change to the Criminal Code came about because of Bill C-104, which gave authorities the right to obtain DNA evidence from uncooperative suspects.

Warrants under the new Criminal Code section have already been served in two bitemark cases — one involving a homicide and the other an infanticide — where the accused had refused to have impressions taken of their dentition.

What's Old

The first Canadian case to involve bite-mark evidence occurred as a result of a 1924 robbery.

As recorded by Dr. Oskar Sykora of Halifax in the *Bulletin of Historical Dentistry* (35(1):64-65, 1987), the incident began on November 14, 1924, when a man broke into a clothing store in Sheet Harbour, Nova Scotia, and helped himself to a large quantity of merchandise.

A Mr. William Steele was subsequently charged with the deed. Part of the evidence assembled by the Crown was an apple core found at the scene of the crime, which was thought to have been thrown away by the accused.

Summonses were issued to two prominent Halifax dentists, Drs. J. Stanley Bagnall and A.W. Faulkner, who were asked to compare the impressions of tooth marks in the apple core with those of Mr. Steele. The dentists were successful in correlating the tooth marks with Mr. Steele's dentition, and their expert evidence ultimately helped to convict the accused.

A notation in the provincial treasurer's records of Nova Scotia shows that the two dentists were remunerated $25 each for the making of plaster impressions. No mention was made whether the accused, William Steele, provided the impressions willingly or not. ■

MSB Audit Provisions Questioned

CDA and its provincial counterparts are questioning the legality of the claims verification audit procedures implemented by Medical Services Branch this year, when it imposed widespread changes to the Non-Insured Health Benefits Program (NIHB).

The concern stems from statements made by Mr. Paul Glover, the acting director general of the NIHB program, in an undated letter that is being presented to Ontario dentists targeted for an NIHB claims verification audit.

In the letter, Mr. Glover advises targeted dentists that: "Liberty Health is the national administrator of the NIHB program for Health Canada and has the responsibility to conduct claims verification audits in your province. Representatives of Liberty Health are authorized to review all data and documentation relating to claims

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submitted on behalf of clients covered under the NIHB program."

CDA recognizes that MSB, as the provider of a third-party dental benefits program, may conduct independent audits of dentists participating in the NIHB program. However, while this right allows plan providers to use profiling and other means to confirm the validity of submitted claims, it does not permit them full access to patient records, or to conduct a complete on-site review of a practitioners files.

Full details of CDA's concerns over MSB's audit activities were published in a special bulletin that was mailed to all CDA members with the March-April issue of *Communiqué*. ■

CDA To Meet With Health Minister

CDA president Dr. James Brookfield will meet with Health Minister David Dingwall May 2 to discuss the amalgam issue and other concerns.

Health Canada is expected to release a policy statement on dental amalgam this summer.

The meeting with Mr. Dingwall follows CDA's participation on the stakeholders committee assembled by Health Canada to review Dr. Mark Richardson's controversial report on amalgam, "Assessment of Mercury Exposure and Risks From Dental Amalgam."

Full details of the committee's findings were provided in the March-April issue of *Communiqué*, and in a CDA President's Letter that was sent to all Canadian dentists with the March issue of the *Journal*. ■

Toronto's Mount Sinai Hospital Serves As TMD Treatment Centre

The craniofacial pain unit at Mount Sinai Hospital (MSH) has been designated as a regional treatment centre by the Ontario ministry of health, and will begin offering distinct surgical treatment to all Ontario patients requiring reconstruction of their temporomandibular joints.

Under the terms of the agreement, the ministry of health will dedicate $126,000 to MSH to cover the cost of providing TM joint prostheses to up to 12-14 patients per year. In the past, while some patients received surgery for TMD at MSH, others were forced to seek treatment outside of Ontario.

Dr. Gerald Baker, director of MSH's oral and maxillofacial surgery division, expressed particular gratification with the agreement, and Health Canada's decision to sanction a TM joint prosthetic replacement system for use at MSH.

Known as the Christensen TM Joint Prosthesis, the appliance is made of cast cobalt-chromium alloy, and is manufactured in about 50 different shapes to accommodate various fossae configurations. The fossa-eminence portion of the appliance is used if the problem is within the glenoid fossa. Although the fossa-eminence and the condylar parts of the prothesis are used together if both the glenoid fossa and condyle are diseased, the condylar part of the prothesis is not used on its own.

"The actual articulating part of the condylar prosthesis in contact with the polished fossa-eminence is a very dense polymethylmethacrylate firmly anchored to a cobalt-chromium alloy base," said Dr. Baker. "The base is manufactured in three sizes to fit different vertical ramus dimensions... Engineering tests have shown virtually no wear on the polymethylmethacrylate condyle after one-million cycles in the laboratory."

In the general population and in normal daily function, it is anticipated that a typical fossa-eminence and condylar prosthesis will function well for at least seven to 10 years before replacement is required.

"Results from the various surgical options commonly used, while helpful, have often been short-lived and often require additional surgical intervention," says Dr. Baker. "It is believed that the Christensen TM Joint Prosthesis, which has been used in the United States since 1961, will allow an early return to reasonable chewing function with a decreased need for repeat surgery." ■

Quebec Endodontists Host "Schilder" Reunion

Eight Quebec endodontists — all graduate students of Dr. Herbert Schilder of Boston University — took advantage of their mentor's presentation to the Federation of Dental Societies of Greater Montreal March 22 to hold a reunion (l to r): Drs. Normand Aubre, Gerry Sohmer, Herb Borsuk, David Auerback, Herbert Schilder (Boston), Isaac Katz, Michael Auerback, Marc Andre Morand, and Serge Lachapelle.

Dental Student Fees Double In Ontario

Tuition fees will double for first-year dental students attending the universities of Toronto and Western Ontario this fall.

With the fee hike, the annual dental school tuition fees at both universities will jump from $4,000 to nearly $8,000. The increase will be phased in, and affect about 100 dental students in the 1997 term. Dental students currently enroled at U of T and UWO will continue to pay a $4,000 tuition fee until graduation.

The increase sets a record for tuition fees at Canada's 10 dental

Annual Bonspiel Boasts Another Sweeping Success

The 28th annual Western Canada Dental Society meeting and bonspiel, held March 13-16, 1996, in Calgary, attracted 36 rinks of curlers from Alberta, Manitoba, Saskatchewan, British Columbia, Ontario and California. Participating dentists enjoyed first-class curling, as well as fellowship, good sportsmanship and dental education.

In 1997, the society's annual bonspiel and meeting will be held March 5-8 in Victoria, B.C. All interested curlers are invited to participate. For information and entries please contact Dr. Rennie Bradley (604) 592-4322, fax (604) 592-4503. ■

This year's Western Canada Dental Society bonspiel champion was the Calgary rink (l to r): Dr. John Thompson, Dr. Ted Allison (presenting the Dr. Cal Waddell memorial trophy), Dr. Steve Petryk, Dr. Joey Brown, and Dr. Greg Mohr.

faculties. It also marks a significant break from statements made by the Ontario government in November 1995, when it announced that grants to provincial universities would be cut by $400 million. At that time, the government said that Ontario universities could raise tuition fees by as much as 30 per cent in certain programs, but no more than 20 per cent on average.

It appears that the rational behind the government's support of the 50 per cent dental tuition fee increase requested by the universities is that the previous $4,000 tuition fee for dentistry only covered about 10 per cent of the approximate $40,000 per year cost of educating a dentist. ■

Open Wide Alberta '96 Treats 4,000 Patients In One Day

More than 4,000 Albertans received free dental care March 30 as part of the Alberta Dental Association's Open Wide Alberta '96 program.

Alberta's premier Ralph Klein accepts an Alberta Dental Association 90th anniversary license plate and lapel pin from ADA president, Dr. Rick Beauchamp.

The initiative, which involved the dental community in 53 Alberta cities, towns and villages, saw 2,000 dentists, dental hygienists, dental assistants, office staff, dental students, day-care interns, administrative staff, educators, bus drivers, dental suppliers and social service agency staff volunteer time, material and services estimated to be worth more than $2.5 million.

Both Shirley McClellan, Alberta's minister of health, and Dr. Rick Beauchamp, the president of the ADA, will sign special certificates of appreciation for the volunteers and donors who participated in the event. In addition, a motion was recently proposed in the Alberta Legislature to highlight and honor Alberta's dentists, the oral care team, and the ADA for the compassionate and caring work done during Open Wide Alberta '96. The ADA celebrates its 90th anniversary this year. ■

California Dental Association Appeals Ruling On Advertising

The California Dental Association (CDA) plans to appeal a Federal Trade Commission (FTC) ruling that effectively prohibits the association from imposing restrictions on the advertising and solicitation activities of its members.

FTC has expressed concern with the association's policy on the advertising of costs and fees. CDA maintains that ads must include verifiable data in order to provide the consumer with a basis for comparison. Otherwise, says the association, such advertising can be deceptive.

"We're taking this to the end and we expect a full reversal of the FTC's decision," says Dale F. Redig, DDS, the executive director of the 19,000-member association. "We expect our members to abide by state laws that protect consumers from false and misleading advertising."

CDA maintains that current California law requires the prices and discount offers contained in advertisements to be clearly defined, and include the regular price, the non-discounted price, and the period of time that discount offers last. ■

APPOINTMENTS

Ontario Society of Endodontists Elects Executive

Dr. Brian Jafine of Toronto has been elected president of the Ontario Society of Endodontists for the 1996 term.

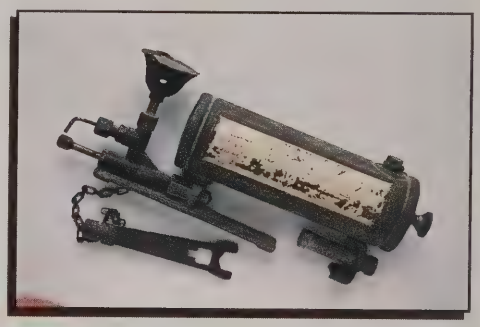
Dr. Brian Jafine

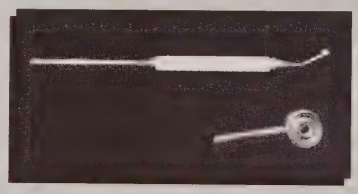
Serving with Dr. Jafine on the OSE executive are vice-president, Dr. Lyon Schwartzben; treasurer, Dr. Stanley Jacobson; secretary, Dr. Mitchell Levine; constitution, Dr. Bernie Yaphe; and immediate past-president, Dr. Phil Shedletsky. ■

WHAT'S IT?

This month's "What's It?" is a Coleman Model No. 527 burner, which is on loan to the CDA museum from Mr. Bernard Rousseau of Hull, an avid collector of Coleman lamps and burners. This particular model was sometimes referred to as a "dental stove" and is believed to have been designed for use in first aid stations behind the front lines. Our model is missing the steel sterilizer pan that fits over the top of the whole burner.

The "What's It?" column would appreciate any information — perhaps from ex-military personnel — about the use of the burner during the war. Please write to Dr. P. Ralph Crawford, 1815 Alta Vista Drive, Ottawa ON K1G 3Y6.





Thanks to Dr. Brian K.S. Kucey of Edmonton, Alberta for helping identify the Pascal U.S.A., rotating head retraction cord packer that was illustrated in the February 1996 "What's It?" column. Dr. Kucey informs us that the instrument came with serrated and non-serrated round ended tips of two lengths. The instrument's main purpose was its ability to move all around a tooth without moving hand or finger rests. ■

OBITUARIES

Dr. Robert F. Harvey — 1917-1995

Dr. Robert Harvey, a legend in the faculty of dentistry at McGill University for 57 years, and one of the great Canadian dentists, died December 11, 1995.

Dr. Harvey received his DDS from McGill in 1941. Apart from his undergraduate training and his service during the Second World War, he dedicated over 50 years to McGill's dental faculty and his particular specialty, periodontics.

A front-line soldier/dentist during the war, Dr. Harvey served with distinction in the Canadian Armed Forces as part of the British VIII army in Europe and North Africa. He saw action both on land and at sea. A navy boat carrying Dr. Harvey was torpedoed and sunk in the Mediterranean. He survived the ordeal and continued in the service. After demobilization, he went onto a successful private practice in Montreal.

In 1946, Dr. Harvey became a demonstrator in periodontology at McGill. He became a junior assistant in 1947, and a lecturer and chairman of the department of oral histology and embryology in 1951. In 1963 he had risen to the rank of part-time clinical assistant, and was promoted to assistant professor in 1964.

Appointed chairman of the department of periodontology in 1969, Dr. Harvey assumed full-time duties as associate professor and received full tenure in 1975. Although he officially retired from teaching in 1983, he was recalled a short time later to assume a key role as coordinator of the periodontics division, a post he held until 1990.

Throughout his 50-year career, Dr. Harvey was highly respected as a teacher, researcher, administrator and advisor. He published locally and in overseas journals, and his frequent papers in the *Journal* were assured to find welcome readers.

Dr. Harvey was awarded his fellowship in the Royal College of Dentists of Canada in 1966. He was a member of the Canadian and American academies of periodontology and the Quebec Association of Periodontists. He was also a life member of the Canadian Dental Association and a fellow of both the American College of Dentists and the International College of Dentists.

Farquharson, Dr. Robert I.: Dr. Farquharson graduated from the University of Toronto's faculty of dentistry in 1979, and practised in Cobourg, Ont. He died February 18.

Ioannidis, Dr. Sam P.: After receiving his doctor of dental surgery degree from the University of Western Ontario in 1994, Dr. Ioannidis associated with the general practice residency program at Vancouver Hospital. He volunteered his services at the Canadian Foundation of World Development in the Republic of Haiti, the Northern Outreach Assignment of Moose Factory, and the Reach Community Dental Clinic in Vancouver. A victim of a tragic car accident, Dr. Ioannidis died February 25.

Morgan, Dr. George A.: A graduate from the University of Toronto's faculty of dentistry in 1930, Dr. Morgan, of Toronto, died March 28.

Rice, Dr. Frederik O.: Died December 30, 1995, at the age of 75. Dr. Rice of Oakville, Ont., graduated in 1949 from the University of Toronto's faculty of dentistry.

LIBRARY PACKAGE

The Library Package for May 1996 is **WOMEN'S DENTAL HEALTH ISSUES.** This package of current information is available to CDA members for $5.00 plus applicable tax.

To order this package, or request information please contact the Library/Information Services Staff at:
tel: 1-800-267-6354;
fax: (613) 523-6574;
or e-mail: cdalib@magi.com

NEW ACQUISITIONS:

Brunette, D.M. *Critical thinking.* Quintessence, 1995.

Engelmeier, R.L. [editor] *Complete dentures.* Dental Clinics of North America. Jan. 1996.

Glick, M. [editor] *Infectious diseases and dentistry.* Dental Clinics of North America. Apr. 1996.

Okeson, J. *Orofacial pain.* Quintessence, 1996.

Senecal, Dr. J.H.: Retired since 1990, Dr. Senecal, of Alexandria, Ont., was a 1949 graduate of McGill University's faculty of dentistry. He died January 28.

Sills, Dr. Roy C.: A 1948 graduate of the University of Alberta, Dr. Sills practised in Edmonton, Alta., Sydney, B.C., and Saskatoon, Sask. Dr. Sills had been on the dental staff of the University of Alberta and the University of Saskatchewan. He died February 13, 1996.

Stephenson, Dr. E.L.: Dr. Stephenson, of Sydney, N.S., died in December 1995. He was a 1942 graduate of the Howard University College of Dentistry in Washington, D.C.

Winograd, Dr. Neville A.: A 1944 graduate of the University of Toronto's faculty of dentistry, Dr. Winograd, of Winnipeg, Man. died in November of last year.

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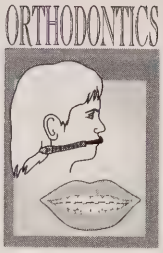


Ortho In The Round

P. Ralph Crawford, BA, DMD

When Dr. James Borovay graduated from the Medical College of Virginia's dental college in 1969, he probably never expected to find himself practising "Ortho In The Round" in a 3,200 square-foot suite on the third floor of a modern office building in the west end of Ottawa.

Nor did he realize that some 27 years later, his busy practice would be sustained by the combined efforts of 10 dedicated, well-trained employees. But he isn't complaining. The team-work environment that surrounds his office makes every day's work a joy. Dr. Borovay received his graduate orthodontic training from Boston University in 1974, and three years later established his Ottawa practice. It wasn't long before he began to dream of the ideal practice setting. Throughout the early 1980s, he pursued this dream by attending practice management seminars, sharing ideas with confreres, scanning numerous journals, and developing a philosophy of practice with the help of his psychologist wife, Dr. Rena Borovay. Above all, he kept noting the shortcomings of an already busy practice.

Over the years, Dr. Borovay's dream began to take shape. Plans were developed based on his concept of the ideal practice, and working models constructed. Throughout, a single thread connected the concept, plans and models. The practice had to be efficient, yet cater specifically to the needs of staff and patients.

Dr. Borovay's "Ortho In the Round" dream became reality in 1987. The central focus is an open operatory, with a circle of five treatment chairs radiating out from three sinks and centralized cabinets. A manuclave and sterilizing area in one corner provides immediate easy access to tray and fully-wrapped cassette set-ups. Two sides of the treatment area are lit by the sunlight shining through floor to ceiling windows.

Supplementing the circle of five chairs are several separate operatories, which provide the necessary privacy for selected cases. And within easy access of the main treatment area are the case presentation room, imaging room, preventive dentistry area, and radiology/cephalometric section, as well as full laboratory and staff rooms. An exceptionally unique feature — only steps away — are the movable shelf-walls storing thousands and thousands of boxes of treatment casts.

The user-friendly concept is evident the instant a patient steps through the doorway. A greeter extends an immediate welcome into a bright, well-appointed reception room, which is designed to make children, parents and mature patients feel equally at home. Movies of the month as well as patient education videos are featured in a miniature theatre, coffee and a telephone is available within an enclave, a video game nestles near the window, and a children's play area is just a step up into a bright corner.

Another unique feature is the business area tucked behind the greeter's desk. It is positioned in the corridor adjacent to the treatment area, and affords patients the opportunity to discuss appointments and financial transactions in privacy.

Despite the traffic of numerous patients, parents and staff, there is nary a semblance of hustling or herding. A friendly atmosphere of "you're welcome, and we care" permeates throughout. ■

The greeter — "Welcome"

Movies of the month

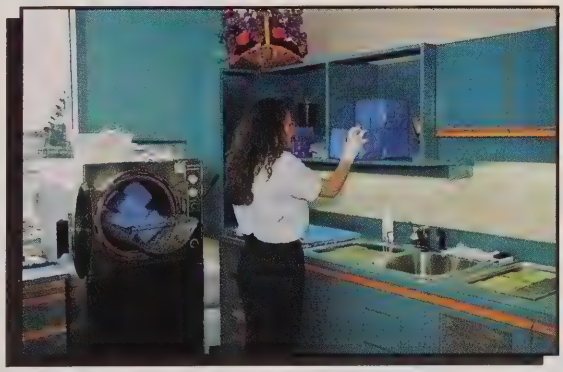
Video games and play area

The business office — in private

Ortho In the Round

When required — treatment in private

Photo imaging



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SELF-LEARNING SELF-ASSESSMENT

The SLSA Program is published as a monthly feature in the *Journal of the Canadian Dental Association* as a resource for dentists wishing to enhance their dental knowledge and expertise. It is intended as a vehicle for self-learning and self-assessment. The program is based on a series of 40 questions, answers, rationales, and references, followed by an annual 15-question quiz. The 1995-96 quiz will appear in the June 1996 issue of the *Journal.* Answers to the quiz will be published in the August 1996 issue. Dentists who complete the quiz may be eligible to receive continuing education points, and their names will be forwarded to their provincial licensing bodies for consideration.

Questions 36 through 40 are a repeat of the questions that appeared in the April issue of the *Journal* accompanied with correct answers, the rationales and specific references. Keep all copies of the *Journal* so you can correctly respond to the June 1996 quiz.

QUESTION 36

When making a bonded amalgam restoration in a deep cavity close to the pulp, you would

(1) always place a lining.
(2) apply dentin conditioner.
(3) use a wetting agent or a primer.
(4) apply a bonding agent.

A. (1) (2) (4)
B. (2) (3) (4)
C. (3) and (4)
D. All of the above.

ANSWER: B

RATIONALE:

Since silver amalgam by itself cannot bond to tooth structure, retention within a tooth is dependent on intact tooth tissue with appropriate undercutting of walls. Sound tooth is therefore sacrificed and the remaining tooth tissue, especially cuspal is undermined and therefore more liable to fracture. Resin adhesive bonding materials for silver amalgam have recently been developed and two such materials are Amalgam Bond and All Bond (Liner F).

- Amalgam Bond consists of a dentin conditioner, a wetting agent and a bonding agent.
- All Bond Liner F consists of a dentin conditioner, a primer and a bonding agent.

In deep cavities the conditioner, wetting agent and bonding agent are well accepted biologically and there is little need to place a lining even when close to the pulp prior to the amalgam placement. Marginal leakage is almost totally eliminated. Cusp fracture is less liable to occur compared to conventional preparations since in addition to avoidance of undercutting, there is a strengthening of cusps due to the bonding process.

REFERENCES:

(1) Jordan, R.E., Suzuki, M. and Balanko, M. Bonded silver amalgam restorations. *J Can Dent Assoc* 58:817-819, 1992.
(2) Gwinnett, A.J., Barafieri, L.N., Monteiro, S., et al. Adhesive restorations with amalgam: Guidelines for the clinician. *Quintessence Int* 45:687-695, 1994.

QUESTION 37

When treating a patient with a cardiac problem, you would avoid use of a local anesthetic containing epinephrine solution because

A. the heart rate will be increased.
B. the venous pressure will decrease.

C. the arterial pressure will increase.
D. None of the above.
ANSWER: D

RATIONALE:
Although it is claimed that cardiac patients should not be exposed to the risk of 1:100,000 epinephrine in local anesthetic solutions for dental procedures, a recent study (1990) showed no difference in either heart rate or arterial blood pressure when epinephrine was included or omitted from the solution. Such was the case even when considerable increase in the levels of epinephrine were found in the blood plasma. The study involved patients undergoing periodontal surgery. When epinephrine was omitted from the solution, hemostasis was insufficient and anesthesia inadequate.

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(1) Davenport, R.E., Procelli, R.J., Iocono, V.J. et al. Effects of anaesthetics containing epinephrine on catecholamine levels during periodontal surgery. *J Periodontol* 61(9):553, 1990.
(2) Meechan, J.G., Thomson, C.W., Blair, G.S. et al. The biochemical and haemodynamic effects of adrenaline in lignocaine local anaesthetic solutions in patients having third molar surgery under general anaesthesia. *Br J Oral Maxillofac Surg* 29:263-268, 1991.

QUESTION 38

In a 21-year old patient, using a panoramic radiograph, you can predict that an impacted mandibular third molar with complete root formation will more readily erupt when
(1) there is sufficient space between the ramus and the second molar.
(2) the tooth is vertical.
(3) the impaction is completely in bone.
(4) the tooth is at the same occlusal level as the second molar.

A. (1) and (3)
B. (1) (2) (4)
C. (2) only
D. All of the above.
ANSWER: B

RATIONALE:
When treatment planning for the removal of unerupted molars, panoramic tomography is superior to periapical radiographs in the coverage given. These teeth are two dimensionally projected on the tomogram.

The study by Venta et al (1991) indicated that the third molars that did erupt after the age of 20 years had specific radiographic features at the initial examination:

- root formation was complete,
- the impacted tooth was in soft tissue,
- the impacted tooth was vertical,
- the tooth was at the same occlusal level as the second molar,
- sufficient space existed between the ramus and the second molar.

If these characteristics are all present, there is good predictability of mandibular third molar eruption.

REFERENCES:

(1) Venta, I., Murtomaa, H., Turtola, L. et al. Assessing the eruption of lower third molars on the basis of radiographic features. *Br J Oral Maxillofac Surg* 29:259-262, 1991.
(2) Hugoson, A. and Kingelberg, C. The prevalence of third molars in Swedish population. An epidemiological study. *Community Dent Health* 5:121, 1988.
(3) Chandler, L. and Laskin, D. Accuracy of radiographs in classification of impacted third molar teeth. *J Oral Maxillofac Surg* 46:656, 1988.
(4) *The Oral Care Report* Vol. 4. Ed. G. Nikiforuk. March, 1994.

QUESTION 39

Peri-implant soft tissue inflammation can be controlled by
(1) chlorhexidine rinses.
(2) topical fluoride applications.
(3) regular maintenance hygiene visits.
(4) removal of plaques.

A. (2) (3) (4)
B. (1) (3) (4)
C. (2) and (3)

D. All of the above.
ANSWER: B

RATIONALE
The control of soft tissue inflammation around an implant is essential for long-term implant success. Little is known about the difference between development of periodontitis of the natural teeth and the loss of osseointegration around implants and their failure.

The inflammation seen in the soft tissue around the implant would appear to be often related to bacterial plaques. Implant materials are bio-compatible but the microscopic rough porous surface may harbour plaques and their organisms to produce soft tissue inflammation.

To offset these difficulties, patients should have a regular regimen of maintenance hygiene visits with evaluation of bone levels from original base line data. Gentle probing with fixed reference points on the abutments to allow for comparative recording is also recommended.

Patient instruction on cleaning with brushes, floss, and other aids, as well as chlorhexidine gluconate mouthwash will reduce the plaque irritants.

Albrektsson et al (1986), recognized researchers in the implant field, have proposed:

1) That an individual, unattached implant is immobile when tested clinically.
2) That a radiograph does not demonstrate any evidence of peri-implant radiolucency.
3) That vertical bone loss be less than 0.2 mm annually following the implant's first year of service.
4) That individual implant performance be characterized by an absence of signs and symptoms such as pain, infections, neuropathies, paresthesia or violation of the mandibular canal.

Although other criteria for success have been published, the above constitutes the basis upon which success has to be measured.

REFERENCES:

(1) Hillenburg, K.L. et al. Peri-implant inflammation. *Pract Periodont Aesthetic Dent* 3:11-16, 1992.
(2) Albrektsson, T., and Sennerby, L. State of the Art in Oral Implants. *J Clin Periodontol* 18:474-481, 1991.
(3) Albrektsson, T., Zarb, G., Worthington, P. et al. The long-term efficacy of currently used dental implants: a review of proposed criteria of success. *Int J Oral Maxillofac Implants* 1:11-25, 1986.
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QUESTION 40

Amoxicillin is
(1) more active against gram-negative cocci than Penicillin V.
(2) more active against gram-positive cocci than Penicillin V.
(3) more active against gram-negative bacilli than Penicillin V.
(4) the drug of choice in prophylaxis against endocarditis.
(5) more liable to produce gastro-intestinal upset than Ampicillin.

A. (1) and (5)
B. (2) and (5)
C. (1) (3) (4)
D. (2) (3) (5)
ANSWER: C

RATIONALE:
Penicillin V (phenoxymethyl penicillin) was one of the first penicillins discovered and remains the best for odontogenic infection control. When taken orally, it reaches a peak serum level within

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1-2 hours after ingestion. It is a low cost antibiotic which adds to its benefit.

Penicillin V is stable in the acid environment of the stomach as opposed to Penicillin G, which is inactivated to allow only 30 per cent absorption of the dose given.

Although gastrointestinal upset may accompany the penicillins, in general, this is most obvious with the use of ampicillin. Any of the penicillins may impair oral contraceptive efficacy and practitioners should warn patients of this.

Amoxicillin is not indicated for routine odontogenic infections. Compared with Penicillin V it has less activity against gram-positive cocci, but because of increased efficacy against gram-negative cocci and bacilli, is the advocated penicillin in prophylaxis against endocarditis.

The major adverse effect of all penicillins is a hypersensitivity reaction which can range from a rash with urticaria to severe anaphylactic shock.

REFERENCES:

(1) Karlowsky, J., Ferguson, J. and Zhamed, G. A review of commonly prescribed oral antibiotics in general dentistry. *J Can Dent Assoc* 59:292-299, 1993.

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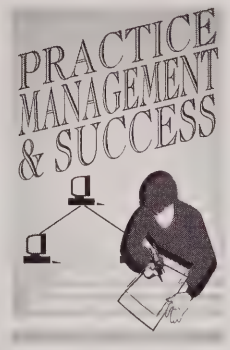

Who's Minding the Store?

Imtiaz Manji, B.Sc.

All across North America, huge mega-stores are opening for business. Typically the size of football fields, the objective of these expansive retail warehouses is to suck up all the consumers in a particular retail niche. Industry insiders call them "category killers."

The first thing that strikes me when I enter one of these retail caverns is the sheer magnitude of the operation. But I am also acutely aware of what's missing from the picture: effective customer service. When and if I require assistance, I have to walk through aisle after aisle before I find someone wearing the trademark green apron, red t-shirt or yellow hat. And more often than not, the "sales associate" that I spent so long tracking down doesn't know the product I'm looking for, doesn't know where to find it on the shelves, and doesn't know if there is a better product available.

Mega-stores make their money solely because of the volume of consumers who walk through their doors knowing what they want and where to find it.

At the risk of offending some people, I'm going to be blunt and say that many dentists in Canada function with a mega-store mentality. I do not mean to imply that the quality of care they deliver to patients is lacking. Rather, my point is that many dentists falsely believe that success in dentistry depends on maintaining a high volume of patients.

A common phrase that I'm hearing in dental practices from coast to coast is, "If only I had a larger patient base ..." But with the growing trend toward flex benefit plans, increased limitations on the types of treatment provided through traditional dental plans, and constantly high unemployment, fewer patients than ever will participate regularly in dental care. There is no vast, untapped pool of wealthy patients who will stampede through your doors tomorrow, next month or next year. You must consider the very real possibility that your patient base will not increase in the next few years, but may actually shrink.

In a recent informal survey, ExperDent found that the average dental practice had overheads of 71 per cent after lab. When you consider the going market rate for hygienists, and the fact that hygiene fees are relatively low compared to other clinical fees in the practice, it is clear that only a small portion of a dentist's take-home income is derived from hygiene revenues. Whether you are a small practice with a single part-time hygienist, or a large group practice with four or more full-time hygienists, a significant majority of your personal income is generated directly by you and the patients you treat in the clinical chairs of the practice.

ExperDent's survey showed that the average dentist generates $253 of production per hour, not including lab fees, with an average range from $194 to $283 (**Fig. 1**). I always remove lab fees from the analysis. It is an "in-and-out" transaction, because 100 per cent of the lab portion charged to patients goes to pay lab expenses. Lab revenues never contribute to the dentist's income. By removing lab fees, the resulting analysis is a more accurate depiction of the true revenue generated by the dentist.

If your patient base shrinks in coming years, the volume of patients coming through your practice will diminish. If you are going to maintain your income, you will have to generate the same productivity from fewer patients. In other words, you will need to increase your case acceptance rate to balance out your decreased patient participation rate.

Unlike mega-stores, which can profit very nicely on selling to customers who know what the want before they arrive, every patient in your practice requires your direct assistance before they can make a purchase decision. The primary factor that determines your personal income is how effectively you assist patients to understand, value, and accept your treatment recommendations.

Case Management Factors

Many dentists have an ill-defined approach to presenting patients with treatment recommendations. However, in addition to diagnosing a patient's clinical needs, the case presentation process must assist patients to:

- understand their oral health and the role it plays over their lifetime
- develop a personal value system that places importance on a healthy mouth and smile
- trust your recommendations and accept the need for treatment
- mobilize their resources to cover the cost of treatment

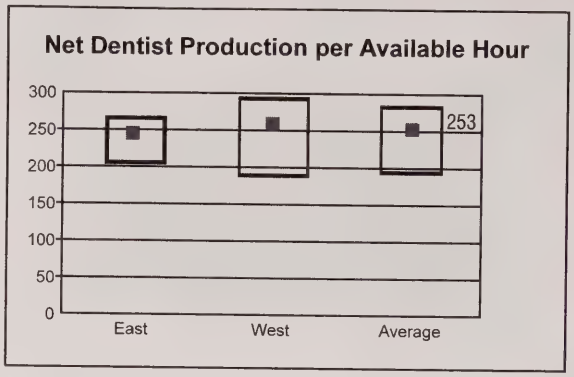

Fig. 1: Does not include lab fees.

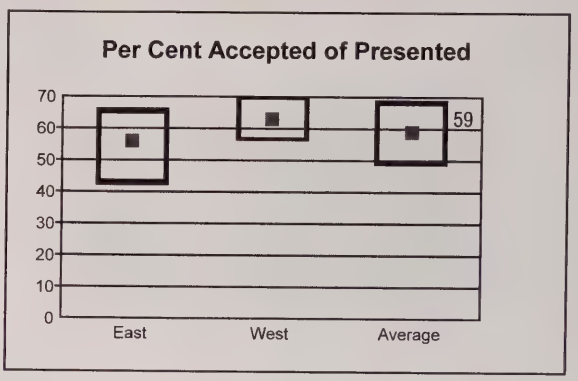

Fig. 2

- feel positive and empowered by good treatment decisions

Sadly, many practices present the treatment needs, but leave the patient to wander around the dental "mega-store" trying to sort out all the other factors involved in the treatment decision. Of course, these practices will readily point out that they are prepared to deal with any concerns the patient might raise. This statement identifies the problem that haunts both mega-stores and case management in the average practice: they operate in a manner that forces consumers, or patients, to self-identify what they want and then seek out the answers.

While mega-store customers can easily identify when they need a garden rake or lawn hose, dental patients have no foundation to self-identify treatment. Educating patients during the case presentation is essential. Without this critical component, patients will not see the need for treatment, they will not want treatment, and ultimately they will not accept treatment.

Figure 2 shows the case acceptance rate for the practices that participated in our survey. The average acceptance rate was 59 per cent, with the majority of practices scoring between 49 per cent and 68 per cent. In the survey, we were careful to clearly define exactly what we meant by "presented" treatment. Specifically, we asked respondents to only consider cases that met the following criteria:

- Do you reasonably believe the patient has the resources to pay for the treatment?
- Do you reasonably believe there is a chance the patient may accept the treatment plan presented?

We wanted to weed out all cases where the practice made no attempt, beyond presenting the diagnostic treatment plan, to understand and assist the patient to accept treatment. A $5,000 esthetic case for a welfare patient did not count. Nor did a basic treatment plan for a patient who stubbornly insisted on extraction from the moment he walked in the door.

To take control of your case management and productivity, you've got to be able to answer the same two questions I've presented above for every patient, and you must do so without making assumptions, or prejudging the patient's values or ability to pay. In order to accomplish this, you must take patients by the hand and guide them through a complete case presentation approach, which must lead them to ask informed questions and reach an educated decision before they leave the practice.

Fortunately, a dental practice differs from a mega-store in one important aspect: Every patient is attended to personally by a member of your team from the moment they enter your practice to the moment they leave. Therefore, every team member has a role to play in building and promoting case acceptance. The danger, of course, is a disjointed and splintered experience for the patient, where no one has clear responsibility or accountability for case management.

Increasing patient demand for esthetic procedures, as well as new treatment modalities such as implants, have given Canadian dentists better diagnostic opportunities than ever before. But success only comes through awareness and accountability, so you must monitor case management each month by keeping track of the total value of treatment presented and accepted by patients.

Even in a very short time frame, practices that deliver a high level of attention to both their clinical diagnoses and case management approach will not only maintain their productivity, but also increase it significantly. Since fixed expenses remain the same, the only incremental costs associated with higher treatment acceptance are variable expenses. For the average practice in our survey, with overheads at 71 per cent after lab, even a modest increase of 10 per cent in case acceptance would result in an astounding 30 per cent increase in practice profitability. This type of result, more than anything else, is what will separate successful and unsuccessful practices in coming years. The difference will be in how well practices deal with the reality of a declining patient base, and how well they increase their level of treatment acceptance.

Next month in the sixth and final article in this series, I will discuss the role of marketing in the evolving dental practice. ■

Imtiaz Manji is a principal of Exper-Dent Consultants Inc., 80-10551 Shellbridge Way, Richmond, B.C. V6X 2W9 Tel.: (604) 278-5059, or fax: (604) 278-1406.

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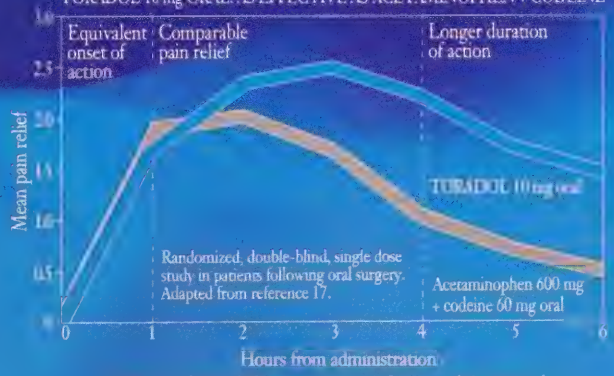

Measure of pain relief: 0=none, 1=poor, 2=fair, 3=good, 4=very good

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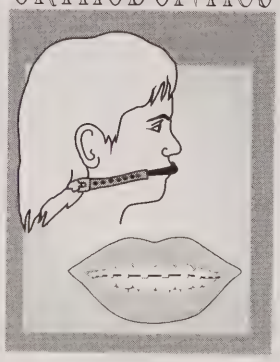

Orthodontic Retention

A.H. Mamandras, DDS, M.Sc.
T.F. Foley, DDS, M.Cl.D.
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ABSTRACT

This article briefly describes several factors that should be considered during orthodontic retention. These factors may influence occlusal stability following the completion of the active phase of orthodontic therapy. Orthodontic retention is an important part of orthodontic treatment. It should always be considered and included in the initial stages of treatment planning, rather than added on at the end of treatment as an afterthought.

SOMMAIRE

Dans cet article, on explique brièvement les facteurs à prendre en considération durant la rétention orthodontique. Ces facteurs peuvent influer sur la stabilité de l'occlusion une fois terminée la phase active de la thérapie orthodontique. La rétention orthodontique est une importante partie du traitement. Elle doit toujours être prise en compte et comprise dès le début de la planification du traitement au lieu d'être ajoutée après coup à la fin.

Introduction

The removal of orthodontic appliances, either fixed or removable, is by no means the end of treatment, as many orthodontic patients like to believe. Rather, it is the beginning of the final and very important phase of orthodontic therapy known as retention.

Etymologically,[1] the word retention is derived from the Latin verb retinere, which means to hold back or to continue to hold. It's importance has long been recognized. Norman W. Kingsley (1829-1913), who Edward H. Angle regarded as "orthodontia's greatest genius,"[2] wrote these words about retention at the turn of the century:[3] "It is not so difficult to straighten crooked teeth. It is not a difficult matter to get the dental system into a position acceptable to your patients and yourself, but to hold it there until it becomes permanently settled is a much more serious problem. It is the one important consideration in all your prognosis. The success of orthodontia as a science, and as art lies in it..., you may rightfully ask of that experience, "How long will that be?" Your patient will pester you with the same query. Out of the same observation and experience, I can only answer: I am agnostic, I don't know. In each and every individual case, I don't know."

Kingsley's words are as pertinent today as they were when he wrote them, nearly a century ago.

Many factors may influence the stability of orthodontic treatment during retention, all of which should be carefully considered in the diagnosis and treatment planning of every case. These factors include cranio-facial growth, the labial and lingual forces acting on the dentition (orofacial soft tissues), dental arch form and the form of retention used (removable or fixed retainer). The role of the third molars during orthodontic retention will also be reviewed.

Cranio-Facial Growth

Understanding the dynamics of cranio-facial growth and assessing both the amounts and directions of growth are of paramount importance, not only during the early phases of treatment but also during retention. Many aspects of the cranio-facial growth that occur during childhood and adolescence have been reported in the orthodontic literature.[4-8] Post-pubertal growth during retention was initially unmonitored and largely ignored. Early speculation about a possible interrelationship between post-pubertal growth and relapse, both during and after retention, was mostly anecdotal. In the last two decades, however, a number of studies[9-14] have provided evidence that growth continues in late adolescence and into adulthood. Based on their reported data, post-pubertal growth is similar to the growth observed during adolescence, although it is of lesser magnitude and rate. These studies also found that the amount of post-pu-

Fig. 1: Hawley maxillary removable orthodontic retainer.

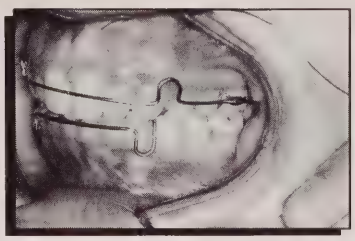

Fig. 2: Modified Hawley maxillary retainer with the labial bow soldered to the bridge portion of Adams clasp on the first molars.

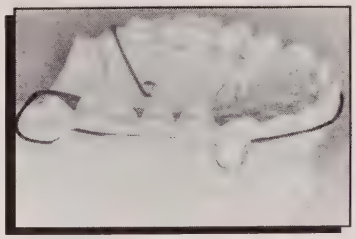

Fig. 3: A full-arch wraparound maxillary removable retainer. This design, as well as the modified Hawley in ***Fig. 2****, eliminates the need for having wires across the occlusion. Both designs are recommended for individuals with very tight occlusal interdigitation.*

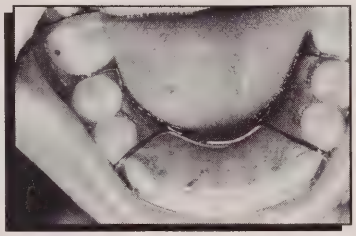

Fig. 4: Mandibular removable orthodontic spring retainer (self-correcting) used to realign mandibular incisors, if mild crowding has developed after orthodontic treatment.

Fig. 5: Fixed mandibular retainer (0.8 mm or 0.032 inch stainless steel wire) bonded on canines.

bertal growth in certain individuals is surprisingly considerable.[12]

Late mandibular growth has been suspected as a major contributor to a tendency toward lower incisor crowding. However, the real impact of post-pubertal growth on the orthodontically-treated dentition needs further documentation, since both the bones and the teeth continue to change with the advancement of age. The bones and teeth change in size as well as in shape and position.[9-14]

Using posttreatment retention strategies that tend to continue the treatment objectives may be the best approach to retention. A good example is the use of headgear during the retention phase of an orthodontically-treated patient with skeletal Class II malocclusion. Another example is the use of a chin-cup[15] appliance in patients previously treated for mild mandibular prognathism.

Applying a restraining force to the mandible using a chin cup may not be nearly as effective in controlling mandibular growth in Class III patients as applying a restraining force (headgear) to control maxillary growth in Class II patients. The extension of treatment objectives into retention could also include the use of dentofacial orthopedic appliances, such as the bionator, in patients with orthognathic maxillas and retrognathic mandibles, particularly those with delayed growth.[16]

Orofacial Soft Tissues

The stability of the teeth during retention is greatly influenced by the labial and lingual forces acting on the dentition.[17] Proclination of the maxillary and mandibular incisors during orthodontic therapy has to be planned with the perioral soft tissues in mind.[18] The same principal consideration applies in cases where posterior maxillary arch expansion is contemplated. Overjet reduction based on the retraction of labially-proclined maxillary incisors should always take into consideration the position and muscular tonicity of the maxillary and mandibular lips. To minimize relapse during retention, treatment planning and occlusal objectives should be formulated with the dynamic aspects of orofacial soft tissues[19-22] in mind, rather than depending only on cephalometric guidelines.

Arch Form

Riedel[23] has listed a number of theorems related to the retention of orthodontically-moved teeth and relapse. Theorem number nine states that "arch form, particularly the mandibular arch, cannot be altered permanently by appliance therapy."

Mixed dentition treatment with dentofacial orthopedic appliances has been shown to allow a widening of the mandibular arch.[24,25] However, when the widened mandibular arches were re-examined a few years posttreatment, a noticeable relapse was observed.[26] Bishara et al[27] studied the overbite, overjet and intercanine width stability six months out of retention. They reported that the percentage of overbite relapse was greater than that of overjet relapse, and also observed that the maxillary intercanine width was more stable than the mandibular intercanine width. Little et al,[28-30] assessing arch stability in patients with a minimum 10 years out of retention, found considerable individual variation in response to orthodontic treatment, irrespective of the Angle classification of the initial malocclusion, amount of crowding, patient age, or sex. They also reported that all cases showed a decrease in arch width and arch length with time. Which patients would have crowding following orthodontic therapy could not be predicted from the characteristics of the pretreatment malocclusion or treatment associated parameters.[28-30]

Third Molars

It seems logical to many clinicians, since erupting teeth generate pressures, that third molars without adequate room to erupt will pressure all teeth mesial to them and cause incisal crowding. However, third molars tend to develop at approximately the same

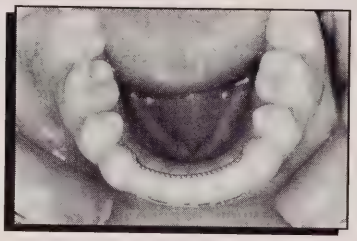

Fig. 6: Fixed mandibular retainer made from 0.0175 inch multistranded archwire.

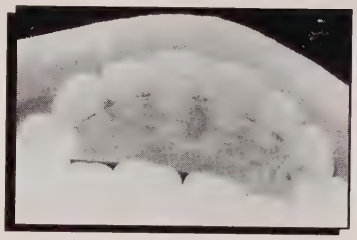

Fig. 7: Fixed maxillary retainer (0.0175 inch multistranded archwire) bonded on all maxillary anterior teeth.

Fig. 8: Fixed mandibular retainer (0.8 mm or 0.032 inch stainless steel wire) soldered on second premolar bands.

time period as other facial and dental changes take place in the stomatognathic system, which may cloud the issue of incisal crowding. Southard et al[31] conducted a study to determine if mesial forces are generated from unerupted third molars, but were unable to document the existence of such force despite the use of sophisticated instrumentations. Kaplan[32] reported no significant differences in lower incisor position or axial inclination among postretention groups of subjects with third molar erupted, third molar agenesis, and third molar impaction. Similarly, Ader et al[33] reported no differences in mandibular incisor crowding among postretention groups with third molar erupted into function, third molar impaction, third molar extraction, and third molar agenesis. The hypothesis that third molars contribute to incisal crowding remains unproven, and there is no overwhelming evidence[34] at this time to support the view that third molars are a contributing factor in incisal crowding.

Forms of Retention

In general, there are two large categories of orthodontic retainers, namely the removable and the fixed. As their names indicate, the removable retainer can be removed and reinserted in the mouth by the patient, while fixed retainers are either cemented or bonded into place by the orthodontist. In theory at least, patients cannot remove a fixed retainer.

By far the most commonly used removable retainer is the Hawley retainer (**Fig. 1**) and its modified versions (**Figs. 2** and **3**). Originally the Hawley retainer was designed as a passive retainer to retain the teeth in their new positions following orthodontic therapy. Other modern Hawley designs incorporate an acrylic base, covering the palate or the lingual surface of the mandibular alveolar process, and a number of wire components such as labial bows with adjustment loops and a variety of clasps and springs.[35] Flat bite planes can also be added to the Hawley retainers in the anterior palatal or posterior occlusal areas, depending on the treatment objectives. The modifications in the design of the Hawley retainer have allowed its use as both a passive and an active removable orthodontic appliance.[35,36] Practical uses for an active maxillary Hawley retainer include closing minor incisal spacing, particularly in fully-banded cases, by activating the "U" loops. (The term "active retainer" is an oxymoron, since an appliance cannot be actively moving teeth and serving as a retainer at the same time.)

If planned treatment includes the extraction of premolars, instead of a standard Hawley labial bow, a modified labial bow, soldered labially to both Adams clasps on the first molars, can be used to help keep the extraction spaces closed.[35] Another type of active removable retainer is a mandibular canine-to-canine spring retainer, which can be used to realign lower incisors that undergo minor recrowding during retention (**Fig. 4**).

Late mandibular growth could cause uprighting and thus recrowding of the mandibular incisors.[35] Subsequently, they need realignment in their more upright positions. Prior to using the spring retainer, a minor reduction (up to 0.5 mm per tooth) of the mesiodistal width of the lower incisors is often necessary. However, enamel reduction is an irreversible procedure and should be done very cautiously and judiciously. If severe rotations were originally present and circumferential supracrestal fiberotomies[37,38] were not performed at the end of treatment, special finishing procedures,[39] usually undertaken at or just before the time of debanding, could be performed cautiously during retention. However, these procedures should be used very selectively and not routinely

In cases where permanent retention is necessary, a fixed retainer should be the obvious choice. These retainers are made of round stainless steel or multistranded archwires (**Fig. 5** and **6**). The latter type of fixed retainer is preferred primarily for its superior retention when bonded.[35] Both types can be bonded on canines only, or on all anterior teeth if required (**Fig. 7**). Round steel wires can also be soldered on canine or premolar bands if necessary (**Fig. 8**). Fixed retainers are ideal for maintaining the closure of a diastema or extraction spaces in adults. A major disadvantage of these retainers is that they make interproximal hygiene procedures more difficult. Also, if part-time wear is needed, then these fixed retainers should be removed and replaced with a removable type of retainer.

Epilogue

Since retention is an important part of orthodontic therapy, it should always be considered and included in the treatment planning, rather than added at the end of treatment as an afterthought.

In addition, a realistic awareness of stability should be kept in mind when formulating our treatment goals. Some of the factors

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Effectively treating acute pain

TORADOL® (ketorolac tromethamine) 10 mg tablets
TORADOL® IM (ketorolac tromethamine injection) 10 mg/mL or 30 mg/mL intramuscular injection
NSAID Analgesic Agent
Toradol (ketorolac tromethamine) is a non-steroidal anti-inflammatory drug (NSAID) that exhibits analgesic activity mediated by peripheral effects.

INDICATIONS

Oral Route: Indicated for the short-term management (not to exceed 5 days for post-surgical patients or 7 days for patients with musculoskeletal pain) of moderate to moderately severe acute pain, including post-surgical pain (such as general, orthopaedic and dental surgery), acute musculoskeletal trauma pain and post-partum uterine cramping pain. (See WARNINGS and DOSAGE AND ADMINISTRATION)
Intramuscular Route: Indicated for the short-term management (not to exceed 2 days) of moderate to severe acute pain, including pain following major abdominal, orthopaedic and gynecological operative procedures. The total duration of combined intramuscular and oral treatment should not exceed 5 days.

CONTRAINDICATIONS

Hypersensitivity: Has been associated with hypersensitivity reactions and should not be used when there is a known or suspected hypersensitivity to the drug. Should be discontinued in patients who develop symptoms of hypersensitivity during therapy. Should not be used in patients with the complete or partial syndrome of nasal polyps, angioedema, bronchospastic reactivity (e.g. asthma) or other allergic manifestations to acetylsalicylic acid (ASA) or other non-steroidal anti-inflammatory drugs. Severe and fatal anaphylactoid reactions have occurred in such individuals.
Gastrointestinal: Should not be used in patients with suspected or confirmed, or a history of, peptic ulcer disease, gastrointestinal bleeding or perforation, or active inflammatory disease of the gastrointestinal system.
Renal Impairment: Contraindicated in patients with moderate to severe renal impairment or in patients at risk for renal failure due to volume depletion.
Haemorrhagic Risk: Contraindicated immediately before any major surgery, and intraoperatively when hemostasis is critical. Contraindicated in patients with coagulation disorders, postoperative patients with high haemorrhagic risk or incomplete haemostasis, and in patients with suspected or confirmed cerebrovascular bleeding.
Obstetrics: Contraindicated in labour and delivery.
Neuraxial Administration: IM route is contraindicated for neuraxial (epidural or intrathecal) administration due to its alcohol content.
Concomitant Medications: Contraindicated in patients currently receiving ASA or NSAIDs. Concomitant use with probenecid is also contraindicated.

WARNINGS

Long-term administration is not recommended.
The most serious risks associated with NSAIDs including 'Toradol' are:
Gastrointestinal Ulcerations, Bleeding and Perforation: Serious gastrointestinal toxicity, such as bleeding, ulceration, and perforation, can occur at any time, with or without warning symptoms. The incidence of gastrointestinal complications increases with dosage and duration of treatment. Elderly and debilitated patients are more susceptible to these complications. To date, studies with NSAIDs have not identified any subset of patients not at risk for developing peptic ulceration and bleeding. Most spontaneous reports of fatal gastrointestinal events with 'Toradol' are in the aged population.
Renal Toxicity: Contraindicated in patients with moderate to severe renal impairment. Acute renal failure, nephrotic syndrome, interstitial nephritis, and renal papillary necrosis have been reported. Elevations of blood urea nitrogen (BUN) and creatinine have been reported.
Hypovolemia should be corrected before treatment is initiated since acute renal failure may be precipitated. Predisposing factors for decreased renal blood flow perfusion include dehydration, sepsis, impaired renal function, heart failure, liver dysfunction, diuretic therapy, and advanced age. Caution is advised in such circumstances. Close monitoring of urine output, serum urea and serum creatinine is recommended until renal function recovers.
Fluid Retention and Edema: Fluid retention, edema, NaCl retention, oliguria, elevations of serum urea nitrogen and creatinine have been observed. The possibility of precipitating congestive heart failure in elderly patients or those with compromised cardiac function should be considered. Should be used with caution in patients with cardiac decompensation, hypertension or other conditions which cause a predisposition to fluid retention.
Haemorrhage: Postoperative haematomas and other symptoms of wound bleeding have been reported in association with intramuscular use. Contraindicated in patients who have coagulation disorders. Careful observation is advised in patients receiving drug therapy that interferes with haemostasis.
Concurrent use with low dose heparin (2500-5000 units q12h), warfarin and dextrans may be associated with an increased risk of bleeding.
In patients receiving anticoagulants, the risk of intramuscular haematoma formation from IM injections is increased.
Hypersensitivity Reactions: The possibility of severe or fatal hypersensitivity reactions should be considered. Counteractive measures must be available when administering the first IM dose. Patients should be questioned for history of allergy to NSAIDs or ASA or for the syndrome consisting of nasal polyps, ASA allergy and asthma.
Use in Pregnancy and Lactation: Not recommended during pregnancy or lactation.
Use in Children: Not recommended for use in children under age 16. Safety and efficacy in children have not been established.
Use in the Elderly: Extra caution and the lowest effective dose should be used.

PRECAUTIONS

Physicians should be alert to the pharmacologic similarity of Toradol (ketorolac tromethamine) to other non-steroidal anti-inflammatory drugs that inhibit cyclo-oxygenase.
Gastrointestinal Effects: Close medical supervision is recommended in patients prone to gastrointestinal tract irritation.
Patients taking any NSAID including ketorolac tromethamine should be instructed to contact a physician immediately if they experience symptoms or signs suggestive of peptic ulceration or gastrointestinal bleeding. These reactions can occur at any time during the treatment. If peptic ulceration is suspected or confirmed, or if gastrointestinal bleeding occurs, Toradol should be discontinued and appropriate treatment instituted with close patient monitoring.
Hepatic Effects: Caution should be observed in patients with impaired hepatic function, or a history of liver disease. May cause elevations of liver enzymes, and, in patients with pre-existing liver dysfunction, may lead to the development of a more severe hepatic reaction. Meaningful elevations of serum transaminases occurred in controlled clinical trials in less than 1% of patients. If clinical signs and symptoms consistent with liver disease develop, or if systemic manifestations occur 'Toradol' should be discontinued. Patients with impaired hepatic function from cirrhosis do not have any clinically important changes in clearance. Studies in patients with active hepatitis or cholestasis have not been performed.
Hematologic Effects: Inhibits platelet function and may prolong bleeding time. Inhibition of platelet function is normalized within 24 to 48 hours after discontinuation.
Blood dyscrasias are rare, but could occur with severe consequences.
Infection: May mask the usual signs of infection.

DRUG INTERACTIONS

'Toradol' is highly bound to human plasma protein (99.2%) however, since it is present in low concentrations in plasma, it would not be expected to displace other protein-bound drugs significantly. Digoxin, warfarin, acetaminophen, phenytoin, and tolbutamide did not alter ketorolac tromethamine protein binding.
In vitro binding of warfarin to plasma proteins was slightly reduced by ketorolac tromethamine (99.5% ➞ 99.3%).
Prothrombin time should be carefully monitored in patients receiving oral anticoagulants concomitantly with ketorolac tromethamine.
Given with heparin mean template bleeding time increased from 6.0 minutes to 6.4 minutes.
Ketorolac tromethamine does not alter digoxin protein binding.
In vitro, salicylates reduce binding of ketorolac tromethamine (99.2% ➞ 97.5%) representing a two-fold increase in unbound 'Toradol' plasma levels.
There is no evidence (animal or human) that ketorolac tromethamine induces or inhibits hepatic enzymes.
Probenecid decreases the clearance of ketorolac and increases ketorolac plasma levels, (3-fold) and half-life (2-fold). Concomitant use of 'Toradol' and probenecid is contraindicated.
Ketorolac tromethamine reduces the diuretic response to furosemide (20%).
Some NSAIDs inhibit clearance of lithium and methotrexate, and increase plasma lithium and methotrexate concentrations and potential toxicities. The effect of ketorolac tromethamine on lithium or methotrexate clearance has not been studied.
Use of ACE inhibitors and NSAIDs may increase risk of renal impairment particularly in volume depleted patients.
IM 'Toradol' has been administered with morphine in studies without evidence of adverse interactions.

ADVERSE EVENTS

For adverse events occurring at an incidence of 1% or less during clinical trials, and adverse events reported post-marketing, consult the Product Monograph.

TORADOL TABLETS

Short-Term Patient Studies (Less than two weeks)
Incidence Between 4 and 9%: Nervous System: Somnolence, insomnia **Digestive System:** Nausea
Incidence Between 2 and 3%: Nervous System: Nervousness, headache, dizziness **Digestive System:** Diarrhea, dyspepsia, gastrointestinal pain, constipation **Body As A Whole:** Fever
Long-Term Patient Study (Approximately one year)
Incidence Between 10 and 12%: Digestive System: Dyspepsia, gastrointestinal pain
Incidence Between 4 and 9%: Digestive System: Nausea, constipation **Nervous System:** Headache
Incidence Between 2 and 3%: Digestive System: Diarrhea, flatulence, gastrointestinal fullness, peptic ulcers **Nervous System:** Dizziness, somnolence **Metabolic/Nutritional Disorder:** Edema

TORADOL IM

Incidence Between 10 and 13%: Nervous System: Somnolence **Digestive System:** Nausea
Incidence Between 4 and 9%: Nervous System: headache **Digestive System:** vomiting
Injection Site: injection site pain
Incidence Between 2 and 3%: Nervous System: sweating, dizziness **Cardiovascular System:** vasodilatation

DOSAGE AND ADMINISTRATION

Adults:
Oral: Usual dose is 10 mg every 4 to 6 hours as required. Doses exceeding 40 mg per day are not recommended. Maximum duration of treatment is 5 days for post-surgical patients and 7 days for patients with musculoskeletal pain.
Intramuscular: Usual initial dose is 10-30 mg, according to pain severity. Subsequent dosing may be 10 mg to 30 mg every 4-6 hours as needed. The lowest effective dose should be administered.
IM administration should be limited to short-term therapy (not over 2 days). Total daily dose should not exceed 120 mg. If supplementary analgesia is required, a concomitant low dose of opiate can be used.
Patients Under 50 kg, Over Age 65 years, or With Less Severe Pain at Baseline:
Oral: Lowest effective dose recommended.
Intramuscular: Lower end of the dosage range recommended. Initial dose 10 mg. Total daily dose should not exceed 60 mg.
Impaired Renal Function: Not recommended for patients with moderate to severe renal impairment.
Conversion from Parenteral to Oral Therapy: Toradol tablets may be used either as monotherapy or as follow-on therapy to parenteral ketorolac.
Follow-on Therapy: Total combined daily dose, oral + parenteral, should not exceed 120 mg in younger adult patients or 60 mg in elderly patients on the day the change of formulation is made. On subsequent days, oral dosing should not exceed 40 mg. 'Toradol' IM should be replaced by an oral analgesic as soon as feasible.
Total duration of combined intramuscular and oral treatment should not exceed 5 days.

AVAILABILITY OF DOSAGE FORMS

Oral Dosage Forms
Available as 10 mg white round film-coated tablets with one side printed red with 'Toradol' inside bold T and other side with Syntex in bottles of 100 and 500 tablets.
IM Dosage Forms
Also available in 1 mL ampoules (trays of 10) containing 10 or 30 mg/mL.
'Toradol' (ketorolac tromethamine) is a schedule F drug.
For full prescribing information refer to the product monograph. The product monograph is available upon request.

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1996 AURUM CERAMIC/DCF GOLF TOURNAMENTS ANNOUNCED:

MILLION DOLLAR CHALLENGE II

PLANNED GIVING PROGRAM

In last month's CDA Journal we presented an overview of our entire Planned Giving Program. Beginning this month, a different method of making a gift to DCF will be discussed and given a sample illustration. Further information is available by contacting Mr. James Wegg (613) 731-0493. All inquiries are confidential.

MAKING A $100,000 GIFT, CASH METHOD:

Dr. Dogood makes a cash gift of $100,000 to DCF in 1996. In 1996, and each subsequent year, his annual net income is $140,000. With the changes to charitable giving announced by Finance Minister Paul Martin in the last federal budget, up to 50% of his net income (previously 20%) can be used for the charitable donation tax credit in each year. Surplus amounts can be carried forward for up to five additional years after the year of the donation.

In Dr. Dogood's province the provincial tax rate is 55% of the federal, resulting in a combined tax credit rate of 45%. (i.e. 29% federal credit + (55% of 29 = 15.95%). Note: the first $200 receives a credit of 26.35% (17% federal credit + (55% of 17 = 9.35%).

Year	Donation Reported	Tax Saving
1996	$70,000 (maximum allowed)	$31,012 (~45% of donation)
1997	$30,000	$13,013
	$100,000	$44,025

Net cost of gift: $55,975 ($100,000 - $44,025) or, government contribution = $44,025.

Next month the new rules for the treatment of gifts of appreciated property will be discussed.

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Kananaskis, AB	June 6	Kananaskis Golf Club
Kelowna, BC	June 7	Gallaghers Canyon Golf Club
Cape Breton, NS	June 13	Dundee Golf Club
Medicine Hat, AB	June 14	Medicine Hat Golf Club
Owen Sound,ON	June 19	Owen Sound Golf Club
Toronto, ON	June 21	Lion's Head Golf Club
Cornwall, ON	June 21	Summerheights Golf Club
Calgary, AB	**June 24***	**Pinebrook Golf Club**
Winnipeg, MB	July 19	Quarry Oaks Golf Club
Edmonton, AB	Aug 22	Indian Lakes Golf Club
Ottawa, ON	**Aug 23***	**Eagle Creek Golf Club**
Victoria, BC	**Sept 6***	**Olympic ViewGolf Club**
Kamloops, BC	Sept 6	Eagle Point Golf Club
New Glasgow, NS	**Sept 13***	**Abercrombie Golf Club**
Lethbridge, AB	Sept 20	Paradise Canyon Golf Club

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that influence stability during retention have been described in this article, but there are undoubtedly many more. Theories regarding retention and stability are very complex and, moreover, not yet complete. In the meantime, individualized treatment planning with due consideration to retention needs and based on thorough analysis, proper diagnosis, and appropriate biomechanics should help our efforts to obtain stable treatment results and minimize relapse during retention. ■

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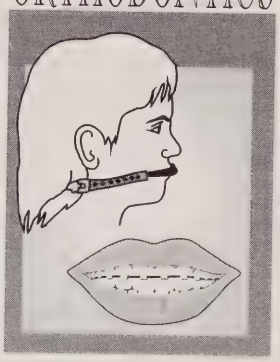
ORTHODONTICS



Orthodontic Treatment in the Mixed Dentition

K.A. Russell, B.Sc., DDS, M.Sc.

ABSTRACT

In the mixed dentition, the goal of orthodontic treatment is to maintain or improve arch integrity for the eruption of the permanent teeth, and to prevent the development of a more complicated malocclusion. The importance of correct diagnosis prior to the treatment of mixed-dentition patients cannot be over emphasized. An understanding of the mixed dentition's normal development allows clinicians to determine if the occlusion is developing outside of the normal range. Appropriate treatment can only be planned after this determination has been made. Once it is concluded that orthodontic treatment is required, decisions must be made regarding the timing of treatment, the specific type of treatment needed, and the provider of treatment. By employing a systematic approach to examination and treatment planning, the general dental practitioner can provide an important service to patients with a mixed dentition.

SOMMAIRE

Dans la dentition mixte, le but des traitements orthodontiques est de maintenir ou d'améliorer l'intégrité de l'arcade dentaire en vue de l'éruption des dents permanentes et d'empêcher la malocclusion d'empirer. On ne saurait trop souligner l'importance d'un bon diagnostic avant de traiter les patients avec une dentition mixte. En comprenant le développement normal de celle-ci, les cliniciens sont en mesure de déterminer si l'occlusion se développe en dehors de la porté normale. C'est seulement ensuite qu'ils peuvent planifier un traitement adéquat. Une fois qu'ils ont conclu qu'un traitement orthodontique s'impose, ils doivent prendre des décisions touchant le moment, le genre précis et le pourvoyeur du traitement exigé. En adoptant une méthode systématique pour l'examen et le plan de traitement, le dentiste généraliste peut rendre un important service aux patients ayant une dentition mixte.

The dental care of patients with a mixed dentition involves monitoring the development of the occlusion and providing appropriate treatment. In these cases, limited orthodontic treatment can be provided by the general dentist, and can significantly improve the permanent occlusion.

In the mixed dentition, the goal of orthodontic treatment is to maintain or improve arch integrity for the eruption of the permanent teeth, and to prevent the development of a more complicated malocclusion. There are four important steps that should be followed when developing a treatment plan for a patient in the mixed dentition stage. The initial step is to correctly diagnose the malocclusion. This requires the clinician to differentiate between the characteristics of the occlusion that are within the range of normal development and those that are not. Next, it is imperative to determine whether the characteristics that are not within the normal range of development require treatment. Finally, it must be determined when and by whom this treatment should be provided.

It should be emphasized, however, that the most important of these four steps is to formulate the correct diagnosis. Without this step, correct treatment is unlikely to occur.

The continual assessment of patients in the mixed dentition stage involves an initial assessment, followed by subsequent reassessment of the dentofacial changes that occur with craniofacial growth. A knowledge of growth patterns and the ability to identify change is essential. Diagnosis involves the assessment of both the extraoral and intraoral facial features. Facial features such as a long lower face height, lip incompetence, muscular strain, a developing Class III skeletal malocclusion, or an anterior openbite indicate either a neuromuscular or skeletal component to the malocclusion, which may complicate the treatment plan. There are other malocclusions in the mixed dentition that typically occur with dentoalveolar involvement, and can often be managed with limited short-term

Fig. 1: Normal developmental incisor crowding.

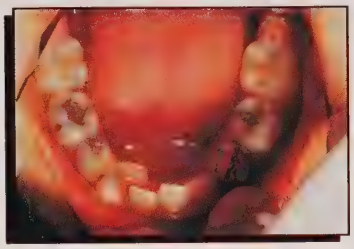


*Fig. 2: Retroclined incisors and arch crowding from the extraction of a C (*note the B is in contact with the D).*

Fig. 3: Dental arch with excellent intercuspation after extraction of the As and Bs (no space maintenance is required).*

orthodontic treatment that improves arch form and occlusion.

In the early mixed dentition, there is frequently minor crowding of the mandibular incisors. Parents are often concerned about this crowding or the lingual eruption of the mandibular incisors, and will seek the opinion of their family dentist to determine if treatment is necessary. Without a good knowledge of the normal development of the dentition, a correct diagnosis and treatment plan cannot be developed.

The mandibular primary incisors are smaller in mesial-distal width than the permanent incisors. Even with the incisor liability, 2.0 mm of incisor crowding in the early mixed dentition is normal. No treatment is necessary in these patients[1] (**Fig. 1**). With the movement of the permanent incisors into a more labial position and the eruption of the permanent cuspids into a more buccal position, incisor alignment should occur on its own in most cases. Furthermore, because of the leeway space available in both arches, there is usually sufficient space for the eruption of the permanent bicuspids and the mesial shift of the permanent molars into a Class I occlusion.[2,3]

However, if 2.0 mm to 4.0 mm of incisor crowding is present, a decision must be made regarding the necessity of treatment. In these cases, a judicial reduction of the mesial-distal widths of the primary cuspids can create arch space to improve incisor alignment.[4]

When there is greater than 4.0 mm of crowding in the anterior mandibular region, the problem cannot be resolved through the dynamic nature of the dentition alone. Treatment may therefore be required. The treatment objective is to align the mandibular incisors without increasing the amount of crowding present in the arch. If the incisor crowding cannot be resolved, one option is to temporarily accept this crowding until comprehensive orthodontic treatment can be started. The extraction of primary cuspids in an effort to align crowded permanent mandibular incisors is somewhat controversial. Nevertheless, in cases with lower incisor crowding, primary cuspids are frequently extracted before a comprehensive diagnosis is developed and often makes the case extremely difficult to treat orthodontically.

Although the extraction of primary cuspids allows the incisors to align, without subsequent space maintenance it can also result in retroclined incisors, increased overbite, deviated midlines, and a more complex malocclusion. This is especially true in patients with hypertonic facial musculature, lower lip habits, lower lip posture under the maxillary incisors, altered tongue posture, and nasal airway obstruction as there is increased posterior force placed on the mandibular incisors.

Posen determined that the facial musculature is significantly more hypertonic in patients with Class II, division II, malocclusions, and that the mandibular incisors can become retroclined rapidly.[5,6] Instead of incisor alignment, the incisors become retroclined, space is lost, midlines are deviated, and arch crowding and the overbite are significantly increased (**Fig. 2**). Proper diagnosis of Class II, division II, malocclusions can prevent these complications from occurring.

Unless particular care is taken to maintain arch symmetry and form, unilateral extractions should be avoided. If space maintainers with spurs distal to the lateral incisors are not placed, midline deviation can occur that may increase the complexity of the orthodontic treatment (**Fig. 2**). In those cases where bilateral extraction of the primary cuspids is deemed acceptable treatment, the placement of space maintainers to allow for alignment of the incisors without additional space loss in the arch is prudent.

Most malocclusions with significant crowding in the entire arch are treated orthodontically in the permanent dentition. However, if there is a minimum of 10 mm crowding in both arches in an otherwise Class I malocclusion with well-related skeletal bases, normal to decreased overbite, and normal overjet, serial extraction can be considered as a treatment option. It is important to properly diagnose a case for serial extraction and to use it only when absolutely indicated.[3]

Management of the dental arches following the unnecessary extraction or premature exfoliation of primary teeth is a common scenario in dental practice. In these cases, treatment should be directed toward maintaining arch integrity and preventing further space loss. It should be noted, however, that the ideal space maintainer is the appropriate tooth in the arch.

The Burlington Growth Study provided data to develop some guidelines for the appropriate use of space maintenance in the mixed dentition.[7,8] These guidelines are simple to remember and apply in your practice. However, it is important to remember that they are only guidelines, and that a complete and correct diagnosis should be made before any treatment is performed:

Fig. 4: Centric occlusion relationship of a bilateral crossbite with a lateral functional shift that appears as a unilateral crossbite.

Fig. 5: Well aligned and related arches after maxillary expansion.

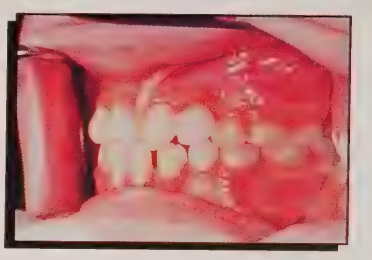


Fig. 6: Centric occlusion relationship of a pseudo Class III malocclusion with as anterior functional shift that appears as a Class III dental malocclusion.

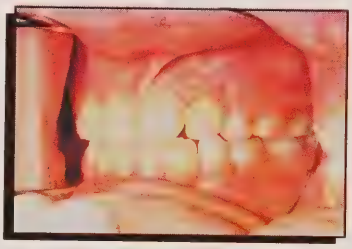


Fig. 7: Well aligned and related arches after proclination of the maxillary incisors.

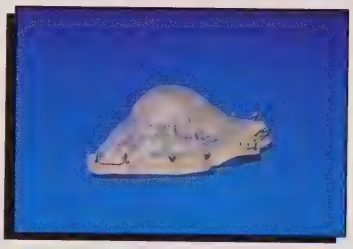


Fig. 8: Maxillary removable appliance to correct anterior crossbite.

1) Loss of maxillary As and Bs (**Fig. 3**)
   - no space maintenance is required if the primary cuspids are fully erupted;
2) Loss of maxillary or mandibular Cs
   - space maintenance — bilateral;
3) Loss of maxillary or mandibular Ds
   - if the permanent laterals and the first permanent molars are fully erupted, no space maintenance is required;
   - if in doubt — space maintain;
4) Loss of maxillary or mandibular Es
   - assess the eruption of the permanent second bicuspids and second molars;
   - if the eruption of the second molars is prior to the eruption of the bicuspid, place a space maintainer;
   - if the eruption of the second bicuspid is ahead of the second molar and sufficient to prevent mesial shift of the molar, space maintenance is generally not required;
   - if in doubt — space maintain.

The management of anterior-posterior or lateral functional shifts in the mixed dentition should be within the realm of the orthodontic treatment that can be provided by the general dentist. Again, correct diagnosis of the problem is imperative if treatment is to be successful. Diagnose must occur with the dental arches in centric relation or at initial contact to correctly diagnosis and treat the real malocclusion.

Lateral functional shifts usually result from a narrow maxillary arch that is in an end-to-end buccal relationship with the mandibular arch at initial contact. To create a functional stable cusp-to-fossa relationship, the patient's mandible shifts laterally. At this juncture, it appears that the patient has a unilateral crossbite in centric occlusion (**Figs. 4** and **5**). Proper diagnosis of this type of malocclusion (at initial contact) includes the identification of a bilateral maxillary lingual crossbite with a lateral functional shift. Treatment consists of bilateral expansion of the maxillary arch. Consideration for either skeletal and/or dental expansion and the vertical dimension of the face must be made before expansion of the maxillary arch can take place. McNamara has published figures for the normal width of the maxillary arch at specific ages. This data can be used as a reference guide to determine if expansion is required.[9] In addition, Howes' analysis can be used to determine if the dental arch is collapsed in relation to the basal bone.[10]

It is imperative to assess lower face height prior to maxillary arch expansion. Expansion tips the cusps of the maxillary molars inferiorly, which, in turn, rotates the mandible in an inferior and posterior direction. This increases the lower face height and decreases overbite. Face height can be controlled in patients with excessive lower face height and/or minimal overbite by using an expansion appliance with a built-in biteblock, or by using the mandibular Gelb appliance concomitant with the maxillary expansion appliance. A patient with a maxillary bilateral lingual crossbite, with either minimal or no positive overbite, or a long lower face height, should be referred to an orthodontist for consultation. In these cases, the orthodontist may prefer to guide the general dentist's treatment or, if the case is sufficiently complex, to treat the patient directly.

Once the maxillary first molars are erupted, expansion of the maxillary arch can be initiated. Expansion prior to the eruption of the first permanent molars is less efficient, as frequently the permanent molars erupt into crossbite. When this occurs, additional treatment to correct the crossbite is necessary. A variety of appliances can be used to correct maxillary crossbites, including a jackscrew appliance (banded, bonded or removable, with or without a biteblock); a quad-helix, or a Porter-lingual appliance.

The appliance selection is based on the diagnosis, and is made on a case-by-case basis. To compensate for the relapse that occurs in the mixed dentition, the arch should be over expanded

such that the lingual cusps of the maxillary molars are in line with the buccal cusps of the mandibular molars. Retention of the corrected crossbite is usually necessary, as the primary teeth are often worn to a flat occlusal surface and there is insufficient intercuspation to maintain the buccal-lingual relationship. The expansion appliance can serve as the retainer if it is made inactive.

In a pseudo Class III malocclusion, anterior functional crossbites occur when the maxillary incisors are retroclined and/or the mandibular incisors are proclined such that the incisors meet in an end-to-end relationship. Although this malocclusion is a Class I dentoalveolar malocclusion with an anterior functional shift, it is referred to as a pseudo Class III dental relationship. In these cases, because there is no skeletal component to the malocclusion, the treatment of a pseudo Class III dentoalveolar malocclusion, with an anterior functional shift in the mixed dentition, can be treated by the general dentist. Patients who have a skeletal malocclusion that is contributing to the anterior crossbite should be referred to an orthodontist.

Emphasis must be placed on the importance of differentiating between a pseudo Class III dentoalveolar malocclusion and a skeletal malocclusion. With pseudo Class III malocclusion, the initial contact is between the incisors. Since this relationship is unstable, the mandible shifts forward — anterior functional shift — to obtain a stable and functional dental relationship (**Figs. 6** and **7**). Trauma to the mandibular incisors is common, and the periodontal condition of these teeth is often compromised. The health of the periodontum should therefore be assessed prior to treatment. Tooth mobility will often return to normal after the function shift has been eliminated and a normal overjet established. A simple removable appliance with finger springs may be placed to procline the maxillary incisors, and sometimes a posterior biteblock to disclude the teeth. This is often sufficient to correct the crossbite, and the occlusion will usually retain the corrected tooth positions (**Fig. 8**).

An extreme mesial eruption path in the first permanent molars may cause them to become impacted on the distal surface of the second primary molar. Particular attention should be paid to second primary molars that have been restored with stainless steel crowns and have increased interproximal convexities. Impaction occurs more often in these restored permanent molars than in unrestored teeth. In such cases, the use of a separating elastic or a spring placed between the teeth will usually move the permanent molar far enough distally to create an unimpeded path of eruption. If separation is not successful, a removable appliance with finger springs may be required. Removal of the stainless steel crown or the primary tooth, and the use of appropriate space maintenance, may also be necessary to allow the permanent molar to erupt.

The possible problems that can arise with orthodontic treatment in the mixed dentition include long treatment times, appliance maintenance, occlusal changes, and unpredictable growth changes. Constant reassessment of the occlusion is necessary at each appointment.

Summary

The responsibility and challenge of anticipating and appropriately managing changes in facial growth and the occlusion during the mixed dentition stage lies with the clinician. It can be very rewarding when managed successfully. The importance of correct diagnosis cannot be over emphasized where treatment of the occlusion in the mixed dentition is concerned. An understanding of normal development allows clinicians to determine if the development of an occlusion is outside the range of normal. Appropriate treatment cannot be planned without this knowledge. The goal of treatment in the mixed dentition is to maintain or improve arch integrity for the eruption of the permanent teeth, and to prevent the development of a more complicated malocclusion. Once the decision to proceed with treatment for an abnormality in the mixed dentition has been made, further decisions regarding the timing of treatment, the specific types of treatment needed, and which clinician will provide treatment (whether it is a general dentist or an orthodontist) must be made. By employing a systematic approach to patient examination and treatment planning, the general dental practitioner can provide an important service to patients in the mixed dentition stage. ■

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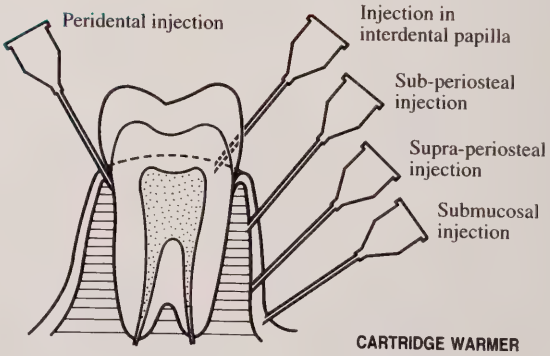

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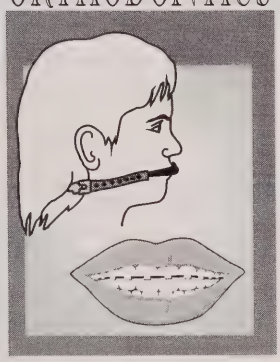

Adjunctive Orthodontic Treatment For Adult Patients

Lorne D. Koroluk, DMD, MSD, MS, MRCD(C)

Peter A. Konchak, DDS

ABSTRACT

An increasing number of adult patients are becoming more aware of their orthodontic needs, and more willing to pursue treatment. This article identifies some of the major differences in the orthodontic treatment of children and adults, and summarizes important aspects of adjunctive orthodontic treatment for adults that may facilitate other dental treatment. In addition, a number of clinical scenarios in which adjunctive orthodontics may enhance the provision of restorative treatment in adult patients are identified.

Key Words: *orthodontics, adults, restorative dentistry.*

SOMMAIRE

Un nombre croissant de patients adultes sont plus conscients de leurs besoins orthodontiques et plus disposés à obtenir des traitements. Dans cet article, on indique quelques-unes des principales différences entre les traitements orthodontiques pour enfants et ceux pour adultes et on résume les points importants touchant les traitements orthodontiques d'appoint qui, chez les adultes, peuvent faciliter d'autres traitements dentaires. De plus, on présente un certain nombre de scénarios cliniques dans lesquels les traitements orthodontiques d'appoint peuvent améliorer l'administration des traitements de restauration chez les patients adultes.

Mots clés: *orthodontie, adultes, dentisterie restauratrice.*

Introduction

During the past 10 to 20 years, there has been an increase in the number of adults seeking orthodontic treatment. Salonen et al[1] examined 920 Swedish adults and found that 11 per cent required orthodontic treatment. In 1977, Levitt[2] stated that the number of adults over 21 years of age undergoing orthodontic treatment would double during the 1980s. Before 1970, approximately five per cent of American orthodontic patients were adults. By the 1980s, adults were estimated to account for approximately 20 to 25 per cent of orthodontic patients.[3] Khan and Horrocks stated that the increased demand for orthodontic treatment by adults could be attributed to improved dental services, and a greater dental awareness among adult patients.[4]

The increased demand for orthodontic services has been stimulated by the introduction of new esthetic appliances to the dental market, as well as by the social acceptability of adults with fixed appliances. Most adults seek orthodontic treatment to improve dental esthetics.[4] McKiernan et al[5] showed that while the majority of patients are referred for orthodontic treatment by their general practitioner, most of these referrals are initiated by the patients. The authors also found the most common reason that orthodontic treatment was not provided earlier in life was that this treatment was never previously recommended. Other reasons given for seeking treatment in adulthood included: re-treatment of previously treated patients, progressive occlusal and esthetic problems that were age related, lack of motivation and funds for treatment in childhood and adolescence, and referral for treatment in conjunction with restorative procedures.

The number of adult patients seeking re-treatment of orthodontic care provided in childhood and adolescence is significant. In an English study, 25 per cent of the adult patients seeking orthodontic treatment had received a previous course of orthodontic treatment.[4]

Authors of previous studies suggest that a significant portion of adult dental patients would benefit from orthodontic treatment, and that this treatment may have been neglected in the past. Practitioners have the responsibility to inform adult patients about the limitations and benefits of orthodontic treatment.

Orthodontic treatment for adults can be complicated and may require a multidisciplinary approach to achieve optimal treatment out-

comes. Musich examined 1,400 adults and found that 30 per cent required multidisciplinary management, which involved orthodontic treatment in conjunction with two or more of the following disciplines: oral surgery, periodontics or restorative dentistry.[6]

Differences In Treatment Between Adults and Children

Probably the most important difference between orthodontic treatment for adults and children relates to growth potential. As there is no appreciable growth potential in adults, orthodontic treatment is carried out by tooth movement alone, and any significant skeletal discrepancies must be corrected surgically. In children, however, practitioners must be aware of future growth potential as well as tooth movement.

Potential growth can be positive in some cases, and even aid in the achievement of treatment objectives. In other cases it can be negative, however, and complicate treatment. Levitt[2] stated that orthodontics for adults is probably more predictable than orthodontic treatment for children, due to the absence of potential growth changes.

Periodontal disease may be a complicating factor in the treatment of adults. Due to age-related factors, children have a lower risk of periodontal disease. The major periodontal problem in children is poor oral hygiene and the related gingival response. In adults, mucogingival involvement and periodontal disease must be treated prior to the initiation of orthodontic treatment. These patients must be able to maintain an acceptable level of periodontal health after initial periodontal therapy. A regular maintenance program during active orthodontic treatment optimizes periodontal health. Once orthodontic treatment is initiated in adults with controlled periodontal involvement, orthodontic forces should be minimized to prevent further periodontal compromise.[7,8]

Adults may also present with more involved restorative and endodontic needs. Active disease and defective restorations should be treated prior to the initiation of orthodontic treatment. However, definitive restorative treatment should be done after orthodontic treatment has positioned the teeth in optimum positions.

Lack of compliance and cooperation in the child patient is a common problem. Psychologically, adults are generally well motivated, appreciative and compliant during orthodontic treatment. Some adult patients may, however, have unreal expectations about the outcomes of orthodontic treatment. Both limitations and reasonable outcomes must be clearly communicated to such patients prior to the initiation of treatment to prevent disappointment at the conclusion of treatment.

Adjunctive Treatment For Adults

Adjunctive orthodontic treatment is basically tooth movement that facilitates the other dental procedures required to control disease and restore function. According to Proffit,[9] the objectives of adjunctive orthodontic treatment are to:

1) position teeth in such a way that more ideal and comprehensive restorative procedures can be provided;
2) position teeth to allow adequate oral hygiene;
3) improve alveolar ridge contours adjacent to the teeth;
4) establish favorable crown/root ratios; and
5) position teeth so that occlusal forces are transmitted along the long axes of the teeth.

As these objectives imply, the goal of adjunctive orthodontic treatment is to correct localized problems. Adjunctive orthodontic treatment is usually of short duration, and requires appliances to be placed on localized sections of the dental arches.

Types Of Adjunctive Treatment

Molar Uprighting

A common adjunctive orthodontic treatment for adults is the uprighting of teeth that have become malpositioned following the loss of permanent teeth due to caries or periodontal disease. The early loss of posterior teeth usually results in mesial tipping of the teeth distal to the lost tooth, and distal tipping of the teeth mesial to the site of tooth loss. Extrusion of the opposing teeth may also occur. Significant extrusion greatly complicates treatment, and usually requires comprehensive treatment to correct the resulting occlusal plane discrepancies.

When considering orthodontic treatment for posterior tooth loss, two treatment choices exist. Distal tipping of the crown can upright a posterior tooth and create space for an adequate prosthetic replacement. Alternatively, mesial tipping of the root can upright a posterior tooth and close the existing space. Of these two treatment options, the mechanics required by the latter option are more difficult.

Careful examination and treatment planning are required in molar uprighting to identify potential problems prior to the initiation of treatment. One consideration is the state of the residual alveolar ridge in the site of the missing tooth. If the ridge shows extensive resorption resulting in reduced buccal lingual width, space closure will be difficult and may compromise the buccal and lingual periodontal support of the molar to be uprighted. In cases with a narrow residual ridge, molar uprighting and a well-designed prosthetic replacement is the treatment of choice. When the alveolar ridge has not resorbed appreciably, teeth can be uprighted and the extraction space closed, which eliminates the need for a prosthetic replacement after orthodontic treatment.[10]

Another consideration in molar uprighting is the number of teeth distal to the extraction site. First permanent molars are most commonly the teeth that have been lost prematurely in such cases. As a result, the second and third molars may drift and tip into the extraction site. Uprighting both teeth and creating a pontic space may result in a poorly-positioned third molar. In these cases, the third molar may be prone to periodontal involvement because of its more distal position and the reduced access available for the maintenance of adequate oral hygiene. Extraction of the third molar usually simpli-

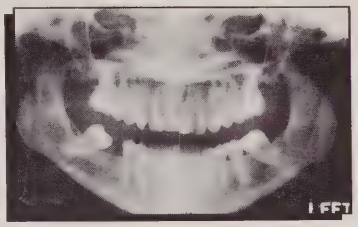

Fig. 1: Pretreatment panoramic radiograph (molar uprighting).

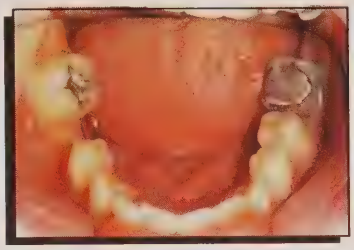

Fig. 2: Pretreatment mandibular occlusal photograph (molar uprighting).

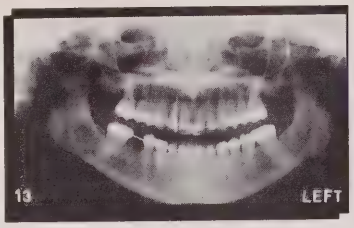

Fig. 3: Progress panoramic radiograph (molar uprighting).

Fig. 4: Posttreatment photograph: right buccal view (molar uprighting).

Fig. 5: Pretreatment photograph (incisor extrusion).

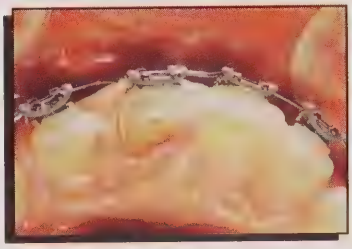

Fig. 6: Progress photograph: maxillary occlusal view (incisor extrusion).

fies the uprighting procedure and reduces the posttreatment periodontal problems associated with third molars. However, if space closure using mesial root movement is contemplated, third molar extraction may not be required.

The uprighting of a mesially-tipped molar can also reduce the mesial pocket depth and improve the patient's posttreatment periodontal health. When distal crown tipping is used for molar uprighting, an extrusive component to the force system usually exists. Extrusion of the molar can have significant deleterious effects on the occlusal plane and resulting occlusion. If a significant amount of extrusion results, comprehensive orthodontic treatment may be required to correct the occlusal plane discrepancies created during molar uprighting. However, if the amount of extrusion is well-controlled and localized to the tooth being uprighted, restorative procedures can be altered during the placement of the definitive restorations to accommodate this extrusion. During tooth preparation, occlusal reduction can be increased to re-establish an acceptable occlusal plane. If excessive reduction is required, endodontic treatment of the extruded tooth may also have to be considered.

Due to the deleterious effects of extrusion during molar uprighting, patients with minimal overbite should be treated with extra caution. Extrusion may create an anterior openbite in these patients. During orthodontic treatment, the curve of Spee is usually flattened or levelled as a result of treatment. Similarly, during localized adjunctive treatment, the curve of Spee in the area of treatment may have to be maintained to allow for an acceptable posttreatment occlusion.

Fig. 1 illustrates a pretreatment panoramic radiograph of an adult patient with bilaterally missing mandibular molars. This radiograph, along with a mandibular occlusal photograph (**Fig. 2**), shows that there is residual spacing between the mesially-tipped right mandibular molar and the second premolar. However, the mandibular left molar is tipped mesially and is in contact with the second premolar. The two possible molar uprighting treatment options are clearly illustrated by the comprehensive orthodontic treatment in the lower arch. **Fig. 3** shows that the right mandibular molar was uprighted by distal tipping of the crown and that a pontic space was created. The left molar was uprighted by mesial root movement, maintaining the contact between the molar and premolar. The definitive fixed prosthesis in the mandibular right quadrant is shown in **Fig. 4**.

Extrusion Of Teeth

Orthodontic extrusion of teeth can be used as an adjunctive treatment for teeth requiring restorations with deep subgingival margins that may compromise the restoration. Teeth with crown fractures that extend subgingivally may also benefit from adjunctive orthodontic extrusion.[11] In these cases, surgical exposure of the margins can be done using ostectomy and gingivectomy procedures. If a significant amount of bone must be removed, the periodontal support for the adjacent teeth may be compromised. The removal of alveolar bone will also result in an increased crown/root ratio for the restored tooth. Orthodontic extrusion may, on the other hand, result in a more favorable crown/root ratio and not compromise the support for adjacent teeth. The amount of extrusion that can be achieved using orthodontics is limited. Teeth that have been extruded to allow restorative access must be adequately retained to prevent relapse of the restored teeth.

Figs. 5, 6 and **7** illustrate a case in which a maxillary central incisor was extruded using orthodon-

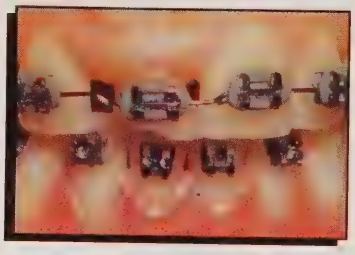

Fig. 7: Progress photograph (incisor extrusion).

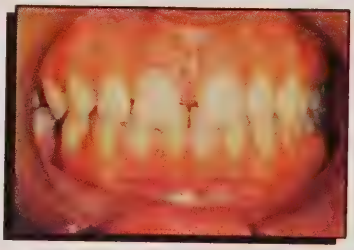

Fig. 8: Pretreatment photograph (space redistribution).

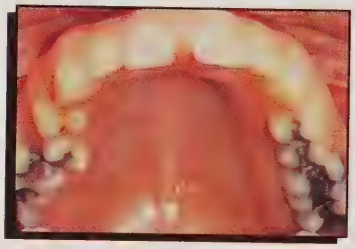

Fig. 9: Pretreatment photograph: maxillary occlusal view (space redistribution).

Fig. 10: Posttreatment photograph illustrating completed restorations (space redistribution).

tics. The amount of extrusion can be observed by comparing the mesial edge of the maxillary right central incisor in **Figs. 5** and **7**. As teeth are extruded, the gingival attachment and contours may change (**Fig. 7**). In some instances, posttreatment gingival contours may have to be surgically modified to re-establish acceptable soft tissue esthetics.

Space Redistribution

Adjunctive orthodontics can be used to reposition teeth and redistribute the available space. Following redistribution, more esthetic and natural appearing restorations or prostheses can be placed. Patients with maxillary "peg-shaped" lateral incisors or congenitally missing incisors are good candidates for this treatment.[12] In this case, the goal of adjunctive orthodontic treatment is to consolidate and redistribute the available space, which permits restoration of the lateral incisors, as well as other teeth, to normal esthetic mesiodistal widths. Acid-etched resins or full-coverage restorations can then be used to establish definitive contours and widths post-orthodontics.

When space redistribution is necessary, a pretreatment diagnostic set-up may help the orthodontist to define the final positions of the teeth, and aid in the visualization of the orthodontic movements required to achieve those positions.

Figs. 8 and **9** illustrate a patient with a maxillary diastema and generalized spacing of the maxillary incisors. Upper arch treatment was used to redistribute the maxillary anterior spacing, and allow the placement of esthetic resin restorations to restore the mesiodistal surfaces of the incisors. **Fig. 10** shows the completed restorations with esthetic mesial and distal contours and contacts. A removable retainer was used to maintain final tooth position after appliance removal and restoration of the teeth.

Alignment Of Incisors

Adults with minimal anterior crowding and malpositioned incisors may also benefit from adjunctive orthodontic treatment. Minimal crowding in the anterior segment is usually considered to include all crowding of less than 4.0 mm. If a stable posterior occlusion is present, space can be created by stripping the mesial and distal contacts of the incisors. As a rule, in an anterior segment of the arch, 0.5 mm can be removed from the mesial and distal surfaces of each tooth to create a total of 4.0 mm of available space. The morphology of the mesial and distal surfaces of the incisors determine how much reduction can be performed without compromising the esthetics of the teeth. Square teeth with long, broad contacts may not be suitable for stripping, as the resulting contours may not be esthetic.

A major problem with performing stripping to create space is the production of a comparative tooth size discrepancy in the anterior segments of the mandible and maxilla. By reducing the combined mesiodistal width of the lower incisors and not reducing the upper incisors, a comparative excess of tooth structure in the maxillary anterior region will be created. As a result, stripping the lower incisors in conjunction with adjunctive orthodontic treatment will result in excess overjet and overbite at the conclusion of treatment. These potential problems must be identified to patients during the pretreatment consultation. If the patient finds such results unacceptable, comprehensive treatment will be required to treat the incisors' alignment.

As previously stated, a diagnostic set-up prior to treatment may help the practitioner assess the end results of treatment and identify any potential problems that may complicate treatment.

Summary

An increasing number of adults are willing to accept orthodontic treatment. Many adults may benefit from adjunctive orthodontic treatment that, in conjunction with restorative procedures, restores function and improves esthetics. During the treatment planning process, practitioners should be aware of the possible orthodontic treatment options that may facilitate the provision of restorative procedures. Such adjunctive orthodontic treatment is usually short in duration and requires the placement of localized appliances. By optimizing the position of selected teeth, restorative procedures may be simplified and the results more esthetic. The longevity of the restorations may also be increased due to the optimum positioning of the teeth in the supporting tissues. ■

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What Is the INR?

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ABSTRACT

The World Health Organization (WHO), the International Committee for Thrombosis and Hemostasis, and the International Committee for Standardization in Hematology, have strongly suggested that INR (International Normalized Ratio) values should be used to report a patient's level of coagulation.

This paper discusses the use of the INR to monitor a patient's coagulation level, and reviews the recommendations on the INR levels at which dental extractions and similar oral surgical procedures may be performed safely. Studies are needed to determine whether new local hemostatic agents are sufficient for the safe management of patients at higher INR levels, thereby avoiding the need for hospitalization and heparin therapy.

Key Words: *INR, Coagulation, Oral Surgery.*

SOMMAIRE

L'Organisation mondiale de la santé, le Comité international de thrombose et d'hémostasie et le Comité pour la standardisation en hématologie ont fortement suggéré que le ratio international normalisé (RIN) soit utilisé pour les temps de coagulation du patient.

Cet article a pour but d'expliquer l'usage du RIN dans la surveillance des temps de coagulation du patient et de réviser les recommandations touchant les niveaux du RIN durant lesquels les extractions dentaire et d'autres procédures de chirurgie buccale similaires peuvent être effectuées en toute sécurité. Des études s'imposent afin de déterminer si les agents hémostatiques sont suffisants pour le traitement sécuritaire du patient à des niveaux plus élevés du RIN, ce qui lui éviterait l'hospitalisation et la thérapie à l'héparine.

Mots clés: *RIN, coagulation, chirurgie buccale*

Introduction

With the increasing lifespan of the Canadian population, more patients with multiple systemic conditions are being encountered in the dental office. Patients on long-term anticoagulation therapy are of particular interest. Today, patients with cardiac, vascular and hypercoagulant diseases are living longer, more normal lives, and frequently appear in the dental office. The prudent practitioner should be familiar with the medical conditions of these patients, and know how to manage them on an outpatient basis. Clearly, proper treatment depends on establishing open and appropriate communication with the patient's managing physician.

This paper will review the methods of monitoring the anticoagulation levels of patients, notably the prothrombin time (PT) and the new International Normalized Ratio (INR) method, in relation to oral surgical procedures. It will also review how this data can and should be used to ensure proper communication among the health care professions involved in the management of these patients.

Anticoagulant therapy is used to reduce intravascular thrombosis. Two of the medications commonly employed in anticoagulant therapy are heparin and warfarin (coumadin). Heparin is used either parentally or subcutaneously. Its action is monitored by APTT (activated partial thromboplastin time), and it has both an intermediate and a short effect.[1,2] Because this medication is rarely administered on an outpatient basis, heparinized patients are unlikely to appear in the dental office. The exception to this rule is pregnant women with deep vein thrombosis, who may receive subcutaneous heparin during their pregnancy.

In North America, warfarin compounds are by far the most widely used anticoagulants on an outpatient basis.[1] They are predictable medications in terms of onset, duration and bioavailability.[3] Warfarin is administered orally and acts on factors II, VII, IX and X.[1-3] It is used for long-term therapy in the prevention of thromboembolic

Table I

Examples Of Therapeutic INRs For Some Disease States

Deep vein thrombosis	2.0 - 3.0
Pulmonary embolism	2.0 - 3.0
Atrial fibrillation	2.0 - 3.0
Porcine cardiac valve	2.0 - 3.0
Mechanical cardiac valve	2.5 - 3.5

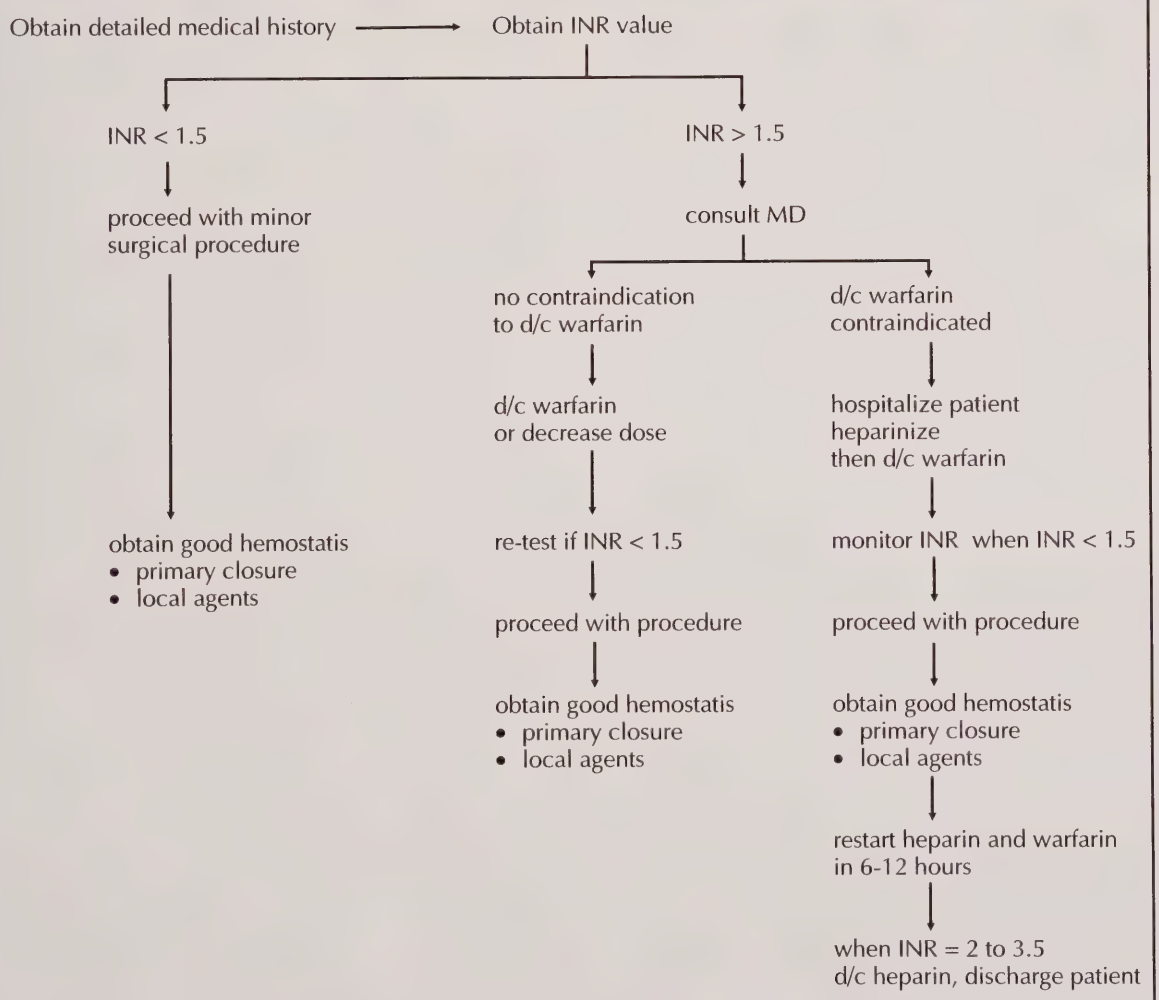
events associated with disease states such as deep vein thrombosis, pulmonary embolism, cerebrovascular disease, cardiac disorders (e.g. atrial fibrillation, prosthetic valves, and post-myocardial infarct) and pro-thrombolic states (e.g. lupus, factor S and factor C deficiency).[1-3] These conditions affect a significant percentage of the population, and the likelihood of anticoagulated patients presenting to the dental office is therefore significant and increasing.

The effect of warfarin is monitored by measuring the patient's prothrombin time (PT). This test is performed by adding calcium and commercially-produced thromboplastin to a sample of the patient's platelet-poor plasma.[1-3]

"Thromboplastin" refers to the phospholipid extract of a tissue. Armand Quick developed the PT test in 1935,[4] using thromboplastin extracted from rabbit brain. At present, thromboplastin is commercially available through numerous sources. PT values obtained from the same plasma sample will vary depending on the commercial thromboplastin used as well as the testing instrument. This leads to difficulties in the interpretation, communication, and control of a patient's anticoagulation level, especially among physicians at different institutions.

Algorithm 1

The Treatment Of the Anticoagulated Patient



Traditionally, PT values were reported as PT ratios. The PT ratio is the patient's PT result divided by a laboratory control value. This laboratory control value is the mean of PT values obtained from a number of healthy patients. However, in view of this approach, the same PT ratio measured with two different commercial thromboplastins may not represent the same level of anticoagulation.

To standardize the PT value, a calibrating system known as the International Normalized Ratio (INR) was introduced in 1982.[3] In this system, each commercially-available thromboplastin is assigned an ISI (International Sensitivity Index). The ISI compares each thromboplastin's sensitivity to an international reference thromboplastin that has an ISI of 1.00.[3] In effect, the ISI is a measure of a given thromboplastin's sensitivity as compared to the international standard preparation. This standard preparation is very sensitive to the effects of warfarin compounds.

The more sensitive a thromboplastin is to the anticoagulation response, the closer its ISI is to 1.00. A less sensitive reagent will have a higher ISI.[3] The INR is obtained by raising the PT ratio to the power of the ISI:

$$\text{INR} = \left(\frac{\text{Patient's PT}}{\text{laboratory control PT}} \right)^{\text{ISI}}$$

The INR value eliminates the variability that occurs when different sources of thromboplastin are used. It therefore provides a clearer means of communication among institutions, and allows the anticoagulated patient to be mobile from institution to institution as well as between countries.

Since 1983, WHO[5] has recommended the use of INR values as a measure of a patient's anticoagulation level. This approach was endorsed by the International Committee for Thrombosis and Hematology in 1985,[6] which recommended that scientific papers should express PT results in the INR form.[3,6]

When the PT ratio was used as a measure of the patient's anticoagulation state, it was generally recognized that dental extractions could be performed on patients whose PT values were 1.5 to 2.0 times the normal value. Of course, it was considered prudent to provide good closure and use local hemostatic agents in these cases. With the growing use of INR as a measure of a patient's anticoagulation level, a new set of guidelines using INR levels must be defined. The normal INR range is 0.8 to 1.3. However, it must be noted that the INR value cannot be used to measure a patient's ability for hemostasis. It only applies as a measure of the anticoagulant level of a patient being treated with oral anticoagulants. Depending on the indications for anticoagulation, a therapeutic INR can range between 2.0 to 3.5 (**Table I**). Some patients may be concurrently treated with low dose aspirin.

In a study by Declerck et al,[7] in which incisors were extracted from rabbits with different INR values, it was determined that a "normal" value of blood loss occurred at INR values of 1.3 to 1.4. When INR values were 1.4 to 1.8, blood loss was significantly greater but "clinically acceptable." In our clinical experience, extractions can be safely performed on patients whose PT values are 1.5 to 2.0 times the control value. In effect, this implies that extractions have been performed on patients with INR values higher than 1.5. Although more clinical data are needed to establish appropriate guidelines for the management of the anticoagulated oral surgery patient, hematologists have suggested that minor surgical procedures, including extractions, can be safely performed on patients with an INR value below or at the upper range of normal, which is 1.5 at our institution.[8]

Patients who present with INR levels above 1.5 should, under the guidance of their physician, have their coumadin dose altered to decrease their anticoagulation level prior to the initiation of oral surgical procedures such as dental extractions. If the risk of a thromboembolic event would be increased by lowering the anticoagulation level, the patient must be hospitalized and heparinized in the perioperative period (**Algorithm 1**). Studies are needed to determine whether new local hemostatic agents are sufficient for the safe management of patients at higher INR levels, thereby avoiding the necessity for hospitalization and heparin therapy. ■

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AUGUST 17 - 20 • **Montréal 1996** • DU 17 AU 20 AOÛT

CANADIAN DENTAL ASSOCIATION CONVENTION / CONGRÈS DE L'ASSOCIATION DENTAIRE CANADIENNE

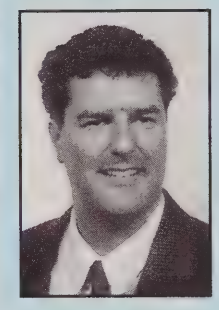
The CDA 1996 Convention:

An Expanded Scientific Program and an Elaborate Schedule of Activities

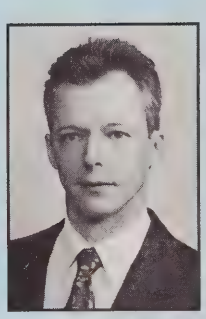
Dr. Michel Jahjah

Dr. Micheline Blain

Dr. Sylvain Gagnon


Dr. Sylvain Laforte

Dr. Sam Sgro


Dr. Joseph Szwimer

This year, with the revised lecture format, participants will have the opportunity to choose from a selection of over 60 presentations on a very wide range of topics. To complement this outstanding scientific program, a full schedule of activities has been designed to satisfy every taste. Following are highlights of these events.

The **Opening Ceremony**, on Sunday, August 18th will inaugurate the Convention. In keeping with our redesigning of the meeting, this year's Opening Ceremony will present a more "serious" component to the event. In addition to the comedian Michel Lauzière who will certainly have you roaring at his antics, the evening will feature David Chilton, author of the *Wealthy Barber*. Mr. Chilton's witticism will also have you laughing while you learn about the subjects of money management and personal finance. Because of the nature of David Chilton's presentation, children attending the Opening Ceremony will be encouraged to join some clowns for an hour of fun and games.

Immediately following the Opening Ceremony, you are invited to attend a **Meet & Greet Casino Night**. While a light supper is served, guests are invited to meet over gaming-tables. Montréal is known for its Casino and we have endeavoured to give you a foretaste of the real thing. Our croupiers will assist you in placing your bets when you play roulette, black jack or baccarat. Come and get caught up in the excitement of the evening even if your winnings only translate into "funny money".

On Monday evening, beginning at 7:00 p.m., the **President's Gala** will take place at the magnificent Montréal harbour. After you leisurely sip cocktails on the deck of a stationary boat, you will be invited to enjoy a delicious dinner accompanied by the sounds of live music. As the evening progresses, you will have the opportunity to board a replica of an old Mississippi riverboat and cruise on the waters of the St. Lawrence river. Or, if you prefer, you can remain on the stationary boat and dance the night away. Whatever your choice, you can be assured of a remarkable evening.

This year, the four full-day **Visits and Tours** are designed for all convention participants. Whether you want to tour the city aboard a deluxe coach, walk the cobblestone streets of Old Montréal, embark on a day trip to the delightful Eastern Townships or give in to your addiction as an inveterate shopper, we have something planned for you.

While their parents attend the scientific lectures or participate in a visit and tour, children can take part in amazing outings. This year, we have added one full day to our **Children's Program**. Children ranging in age from 6-12 years old, may choose to spend a day at the Mountain, IMAX theatre and Sports Magician Museum. They will also enjoy a great day at the Zoo and enjoy the thrill of heart-stopping rides at La Ronde Amusement Park. All children's activities are fully supervised.

As in previous years, participants may enrol for sports activities. A **Golf Tournament** sponsored by Aurum Ceramic/Classic is scheduled for Sunday, August 18th at the Terrebonne Golf Club. Golfers will enjoy beautiful greens and have the opportunity to walk away with $100,000. On Tuesday morning, the annual **Fun Run and Walk** will take runners, joggers and walkers on the slopes of Mont-Royal. Everyone taking part in the event will enjoy an invigorating start to their day.

As members of the 1996 Organizing Committee, we invite you to participate in the social program and in the many activities planned for you. Don't hesitate to call the CDA Convention office (1-800-267-6354) for more information. To help us make this Convention even more memorable for you, please register early... Register NOW!

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M·O·N·T·R·É·A·L 1996

A Sensational Social Program

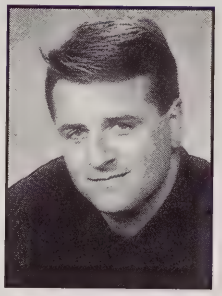
Ash Temple & CDA Conventions invite you to the

OPENING CEREMONY

Sunday, August 18
5 - 7 p.m.

This year, Convention participants will not go away empty handed from the Opening Ceremony. There will be a wealth of information to gather on the subjects of personal finance and money management.

These valuable tips will be given out by none other than the famous Canadian author of *The Wealthy Barber*, **Mr. David Chilton**. In his witty presentation entitled, Learn For Yourself — Nobody Cares More About You, David Chilton will share his "Common Sense approach to successful financial planning. The hour you'll spend with David Chilton may revolutionize your thinking about savings, investments and money management.



David Chilton

Before Mr. Chilton's presentation, the world-famous comedian **Michel Lauzière** will have everybody in "stitches". This performer stretches your imagination as to what is "normal and feasible". He plays music with an electric hand-mixer and a bicycle pump, jumps out of his clothes in less than 5 seconds and bounces around the stage in a giant balloon.

Children are invited to enjoy Michel Lauzière's presentation and to follow the clowns for a time of fun and games during David Chilton's talk.

Michel Lauzière

Immediately following the Opening Ceremony, participants are invited to come and try their luck at the Casino. Several gaming-tables will be staffed by knowledgeable croupiers who will help you "place your bets". Everyone can play just for the fun of it since we'll be very generous with our "funny money". A light buffet supper will be served in a lively ambiance. Bring your family, come meet your peers and the members of your staff for an evening of sheer entertainment.

SUNDAY AUGUST 18

MEET & GREET

CASINO NIGHT

7:00 - 10:00 pm

President's Gala - Dinner Cruise

MONDAY, AUGUST 19

7:00 - 8:00 pm cocktails
8:00 pm onwards dinner & cruise

A delightful evening has been planned for this Gala night. First, you will sip cocktails on the deck of a stationary boat as the sun sends golden hues behind the city skyline. Following cocktails, you will be invited to a sit-down dinner where you can enjoy the company of your colleagues and friends.

As the evening progresses, you will have the opportunity to board a replica of an old Mississippi Riverboat and cruise leisurely around the Montréal harbour. Or, if you choose, you can stay behind and dance to the sounds of lively music.

The Opening Ceremony is open to all Convention participants but you must reserve your place to attend. TO REGISTER for a social event, just fill out the relevant sections of the registration form and send the appropriate fees where applicable.

DRAWS AND SPONSORS

Great Draws are Part of the Montréal 1996 Convention

Mode of transportation is the theme for the grand prizes at this year's CDA Convention.

A one year lease on a ***Mercedes-Benz C220 S.E.*** will be awarded to a Canadian dentist compliments of **Aurum Ceramic/ Classic and Mercedes-Benz Canada!**

AND the official carrier of the Convention, **Air Canada**, is giving away ***two economy class tickets to any North American destination serviced by the airline*** (some restrictions apply) to one lucky Convention participant!

Qualifying couldn't be easier — simply register before July 26, 1996 and bring your ballot to the Exhibit Hall.

Major Sponsors

Ash Temple LIMITED

AURUM CERAMIC DENTAL LABORATORIES

DENTSPLY CANADA

Sponsors

AO ACADEMY OF OSSEOINTEGRATION

AIR CANADA

BIODENT Dentisterie Bio-Compatible Dentistry

CDSPI

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Pro-Dentec Canada PROFESSIONAL DENTAL TECHNOLOGIES, INC.

Roche

SAFESKIN

straumann CANADA

Transitions

YOUNG DENTIST PROGRAM

A program especially designed for those who graduated between 1986 - 1996.

AS A YOUNG DENTIST WHO GRADUATED BETWEEN '86-'96, DO YOU SOMETIMES ASK YOURSELF QUESTIONS SUCH AS THESE?

- **Am I communicating adequately with my staff?**
- **Am I giving my elderly patients the optimal care they deserve?**
- **Am I ready to incorporate implant dentistry in my practice?**
- **When is it too late to achieve my financial goals?**
- **In the future, what choices will there be between metallic and non-metallic posterior restorations?**
- **What are my investment alternatives?**
- **What kind of personal insurance should I have as a starting dentist and how should it evolve?**

The above questions and many more will be answered through the Young Dentist Program at the CDA 1996 Convention. Speakers will present valuable information and practical applications that you will find helpful for your practice.

Join your colleagues who have graduated between 1986 and 1996 for a terrific program designed especially to meet your needs during the first ten years of your career. The Canadian Dental Association and the Canadian Dental Service Plans Inc. (CDSPI) have designed a full day of lectures and social activities for the newest members of the dental profession. This program has been developed by the CDA New Dentist Committee in collaboration with the Convention Organizing Committeee.

Registration to the Convention entitles you to participate in the Young Dentist Program. To register, complete the registration form and check the Young Dentist Program section to receive your ticket.

YOUNG DENTIST PROGRAM — Monday, August 19

7:30 - 8:15	Coffee, muffins and music with other Convention participants
8:15 - 9:15	Keynote Session on Nutrition by Robert Pritikin
9:30 - 10:30	The 1990's: A Great Time to Start a Practice by Dr. Paul Bass
10:30 - 11:15	Practical Financial Management for New Dentists by Peter Volpé
11:15 - 12:00	Insurance Protection for Financial Well-Being
12:00 - 1:30	Lunch and visit of the Exhibit Hall
1:30 - 2:15	Aesthetic Posterior Restorations by Dr. Mike Suzuki
2:15 - 3:00	Aging Periodontal Prosthodontic Patients: Problem Solving and Practice Building by Dr. Harry Rosen
3:00 - 3:45	Osseointegration: Its Uses and Abuses by Dr. Perry Goldberg & Dr. Marvin Werbitt
3:45	Cocktails

All lectures in this program will have simultaneous interpretation.
For a more complete description of each lecture, consult the CDA 1996 Convention Preliminary Program.

BUSINESS OPPORTUNITIES

CENTRE FOR BUSINESS OPPORTUNITIES

ANOTHER NEW FEATURE OF THE 1996 CONVENTION

In a continued effort to better meet your needs, there will be a specially designated area where business opportunities will be made available at the CDA '96 Convention. This year, not only will you be able to learn and exchange ideas at the Convention, you may also meet the person that will offer you the business opportunity you are looking for.

Are you seeking to buy or sell a practice or to form an associateship with a fellow dentist? Do you want to hire someone to work in your practice? Or perhaps, you are interested in working in someone's office even, a few days a week? **Then the CENTRE FOR BUSINESS OPPORTUNITIES is the place for you.**

For the Centre to work, however, we need your cooperation! We will help you get in touch with those who will express interest in areas matching your business. Arrive on-site fully prepared to take advantage of this free and totally confidential service that will be offered solely to those dentists registered for the Convention (vendors are not invited).

For more information, inquire at the Information counter on-site at the Convention or contact Laura Stephenson at the CDA Convention office (1-800-267-6354).

Table Clinic Program

Have you recently come across some information or discovered new techniques that have made a difference in the way you treat your patients?

Or, perhaps you have been effecting a procedure or used a product in an innovative fashion.

Through the Table Clinic Program at the CDA Convention, you are invited to share with your peers, information which will facilitate and further the practice of dentistry.

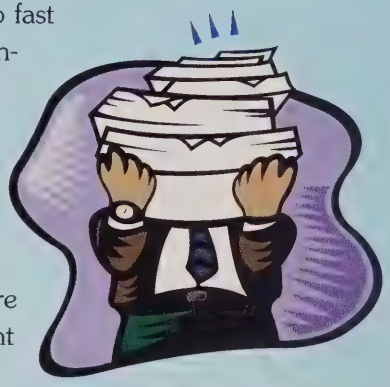
The CDA Convention is about Canadian dentists meeting and learning from each other. Participate in the discussion in an active manner and benefit your colleagues by sharing your knowledge.

FOR MORE INFORMATION
on how to become a Table Clinician, simply call the Convention office (1-800-267-6354).

SCIENTIFIC PROGRAM

CDA 1996: *A Leading Edge Scientific Program*

In dentistry, as in every evolving sphere of activity, developments take place so fast that it is not uncommon for materials to be phased out even before they are entirely used up in the office. Yesterday's techniques are often obsolete today and equipment is sometimes out-dated by the time you make a purchase. Faced with the entire gamut of products and services, it is extremely difficult to make an informed decision.



To compound the difficulty, there is no longer one "guru" who can tell you what to buy. Every researcher and lecturer has his/her specific preferences and there are no unanimously accepted opinions. The responsibility for making the right choices clearly falls on the shoulders of the individual dentist.

To keep abreast of all the latest developments, you need factual and up-to-date information. You also need to hear the different views concerning what's out there. The Convention Organizing Committee had this in mind when it elaborated the Scientific Program. At the Convention, each course and every lecture is designed to bring you knowledge that will keep you on the cutting-edge of today's advances. To facilitate your decision-making process, you will hear a variety of opinions on techniques, materials and management from different speakers, all expressing their own viewpoints.

Here are some of the subjects and questions which will be addressed at the 1996 CDA Convention:

- The latest in instrumentation to perform high calibre endodontics.
- Integration of implant prosthesis in everyday practice.
- How much insurance protection is "adequate" for my practice and what are some of my options?
- What's new this week in "adhesive dentistry" and how is it changing the way we practice dentistry?
- Is there a best method for screening and diagnosing periodontal disease?
- Are you daming? If not, why not?
- The importance of space management in guiding the developing dentition.
- Fats, antioxidants and dietary fibres — what's the right amount?
- Smear layers, sealing a restauration and what is a hybrid layer of the bonded restauration?
- Interceptive, orthopaedic, and functional appliances. Which ones to use and not abuse?
- Oral lesions, pre-malignant to malignant. How can we tell?
- As a young dentist, what does the future hold?
- Glass ionomers, compomeres, glass ceramics, bonding systems... and the question is: In which generation are we now?
- Reconciliating esthetic and function in paedodontic.
- Chance encounter with the maxillary sinus.
- Is financial security a myth or can it become a reality?
- Clinical and pharmacological therapies for endodontic emergencies.
- Can a chemist set the record straight about radon in the basement, lead in dinnerware and mercury in our fillings?
- Why are the 90's a great time to practice dentistry?
- Verbal skills needed for patients to accept the best treatment — not just what insurance pays.
- Restauration of endodontically treated teeth. Are we talking about radicular reinforcement?

These are only a few of the questions that will be answered at the Convention.

— PLAN NOW TO ATTEND —

SCIENTIFIC PROGRAM

A half-day or full-day limited attendance course and hands-on workshop offer Convention participants great value. You can learn a new technique and sharpen your clinical skills or you can learn how to communicate better with your clients and staff. These sessions are designed around theory but focus on practical applications for your office. The smaller number of participants creates an optimal learning environment for you and your team. Register early as space is assigned on a first-come, first-served basis. Consult your 1996 Convention preliminary program for course descriptions.

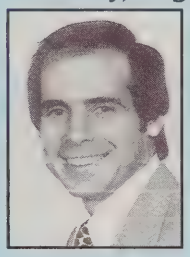
LIMITED ATTENDANCE COURSES

Saturday, August 17

David S. Hornbrook, D.D.S.
La Mesa, CA

Mastering Aesthetics and Adhesion — Dental Care for the 21st Century

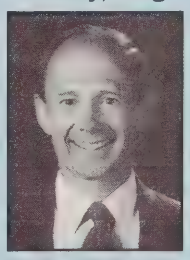
Saturday, August 17



Louis Touyz, B.D.S., M.Sc., M.Dent
Montréal, QC

A New Look at Periodontics in the Nineties

Sunday, August 18



William Blatchford, D.D.S.
Sunriver, OR

Presenting Ideal Treatment and Getting a Yes!

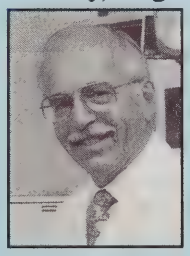
HANDS-ON WORKSHOPS

Saturday, August 17 & Sunday, August 18

Pierre Boudrias, D.M.D., M.S.D.
Montréal, QC

Implants: Basic Prosthetic Certification Course

Sunday, August 18



Herbert Bader, D.D.S.
Boston, MA

& Jane Jones, R.D.H.
Lake Worth, FL

Scaling and Root Planing

Sunday, August 18

Gary Glassman, D.D.S.
Toronto, ON

& Kenneth Serota, D.D.S., M.M.Sc.
Toronto, ON

Endodontic Impressionism: A Palette for Excellence

COME *SURF* WITH CDA

Some of you have been "surfing the Net" for quite some time and have achieved a high degree of sophistication. You are experts in doing searches, downloading programs and printing articles of interest. For others, the Internet is a big black hole overflowing with all the information they'd ever want to know. However, not only are they not surfing, they never even got their feet wet yet.

Whatever your degree of expertise, CDA wants to invite you to come surfing at the Convention. Lecturers will introduce you to the Internet, explaining what in reality is a "web site" and a "home page" as well as interpreting some wild jargon terms you may read or hear. In only a short time, you will be able to recognize all these expressions, choose a "server", send and receive E-mail, access the CDA web site...

For your convenience, there will also be an area set up at the CDA booth in the Exhibit Hall where experts will help you try your skills and send you surfing.

Keep reading the blue pages of the *CDA Journal* for more information.

KEYNOTE SESSIONS

KEYNOTE SESSIONS *will provide participants with* ACCURATE, PRACTICAL *and* SCIENTIFICALLY-BASED *information on* Nutrition. *The latest research and developments in the field of nutrition are the focal point of each presentation.*

MONDAY, AUGUST 19

8:15 - 9:15 am

ROBERT PRITIKIN

The Fat Instinct: How You Can Outsmart It!

The speaker will introduce the breakthrough science that has led to the discovery of the Fat Instinct and then present a simple plan of action that can help us outsmart it by learning to change our food preferences and aversions to exercise.

Robert Pritikin is the Director of the Pritikin Longevity Centers in Santa Monica, CA and Miami Beach, FL. The medically supervised programs which he directs are designed to give participants a broader understanding of nutrition, exercise and stress management and to provide the knowledge, skills and support to maintain successful lifestyle habits.

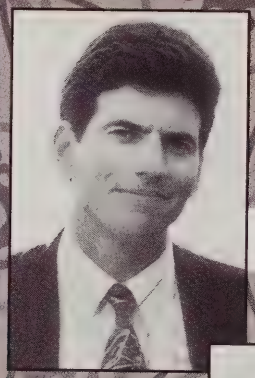
1:15 - 2:15 pm

MICHAEL JACOBSON

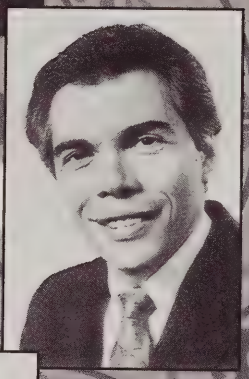
Nutrition and the Politics of Food

This presenter talks about how educational and advocacy campaigns have persuaded millions of people to improve their diets, spurred a number of manufacturers and restaurants to provide more healthful foods and won legislation that requires nutrition information on all food labels.

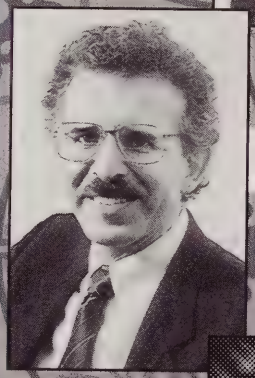
Dr. Jacobson holds a Ph.D. in microbiology from the Massachusetts Institute of Technology. He is co-founder and executive director of the Center for Science in the Public Interest (CSPI), a non-profit health-advocacy organization which focuses on nutrition, food safety and alcohol policy.



ROBERT PRITIKIN



JOSEPH SCHWARCZ



MICHAEL JACOBSON

LOUISE LAMBERT-LAGACÉ

TUESDAY, AUGUST 20

8:15 - 9:15 am

JOSEPH SCHWARCZ

Sense, Nonsense & Science

Dr. Schwarcz will talk about the many gimmicks, "fast and easy cures" and misunderstandings surrounding nutrition and health in our lives today. He will show that only a proper scientific examination of these issues can reveal whether they fall into the category of sense or nonsense.

Dr. Schwarcz is on the faculty of the chemistry department at Vanier College, is a Senior Adjunct Professor at McGill University and is the science editor of the largest English language radio station in Montréal. He has received more awards for teaching chemistry than anyone else in Canadian history.

1:15 - 2:15 pm

LOUISE LAMBERT-LAGACÉ

The Recipe for a Successful Diet

Ms. Lambert-Lagacé's aim is to promote better health through better nutrition. She will pinpoint our most common mistakes and provide specific information on selecting the right foods in an overabundant marketplace.

Ms. Lambert-Lagacé holds a B.Sc. (Nutrition) from the Université de Montréal. She has over thirty years of experience in the field of nutrition and has won numerous awards for her contributions to health and nutrition.

TOGETHER IN '96 TOGETHER

SPECIAL EVENTS

$100,000 HOLE-IN-ONE!

Participate in the CDA-Aurum Ceramic/Classic Golf Tournament and You May Leave the Golf Course $100,000 Richer

The CDA-Aurum Ceramic/Classic 1996 Golf Tournament will take place on Sunday, August 18 at the Terrebonne Golf Club with a shotgun start at 9:00 a.m. This golf course has beautiful greens of over 6,000 square feet.

The hole-in-one competition will take place at the end of the day. During regular play, a selected number of participants who are "closest to the hole" at a designated hole will have the chance to compete for the $100,000 prize.

The CDA will donate twenty dollars of each entry fee to the Juvenile Diabetes Foundation. What a great way to contribute to a good cause and enjoy yourself at the same time! Transportation, golf carts and a light lunch are included in the registration fee.

TO REGISTER, simply check the "Golf" section of the enrolment form and send the required fees. If you have a foursome, send in the four names with your enrolment. Note: All four players need to be pre-registered for the golf tournament in order to make a foursome.

Space is limited. Registration will be processed on a first-come, first-served basis.

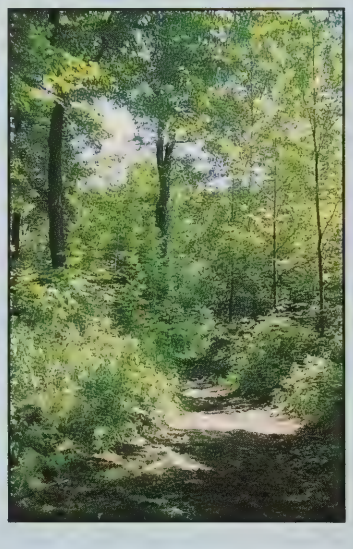
ANNUAL FUN RUN & WALK

TUESDAY, AUGUST 20

Run/Walk starts at 7:00 am

On Tuesday morning, start your day with an invigorating run or a brisk power walk at the annual Fun Run and Walk. Bring your workout accessories and face the challenges of the 5/10 kilometre run/walk along the pathways surrounding Beaver Lake atop Mount-Royal. Mount-Royal is the most popular green space in Montreal and is a wonderful retreat back to nature.

Running/walking time will be recorded and prizes will be awarded. Each participant will receive a 1996 Convention T-shirt and refreshments will be available.



Convenient Air Travel for Convention Participants

Air Canada is the official carrier of the CDA 1996 Convention in Montréal.

Air Canada is pleased to participate in our meeting and is offering special convention rates for those attending the Convention. In addition, you can earn Aeroplan or OnePass miles when you fly.

When booking your flight, mention the **Convention Central No. CV960671** to obtain convention rates.

For reservations and information, contact your travel agent or call Air Canada directly at 1-800-361-7585.

AUGUST 17 - 20 • **Montréal 1996** • DU 17 AU 20 AOÛT

CANADIAN DENTAL ASSOCIATION CONVENTION / CONGRÈS DE L'ASSOCIATION DENTAIRE CANADIENNE

ONE FORM PER PERSON

PRE-REGISTRATION & HOTEL RESERVATION FORM • Please PRINT

1. Use **1 FORM FOR EACH INDIVIDUAL** you would like to register. You may photocopy the enrolment form, or you can obtain additional forms by contacting CDA Conventions at 1-800-267-6354.
2. **EACH** individual's name should be printed clearly in the appropriate section. **EACH** individual form should select a **DELEGATE TYPE** in order to register for the Convention.

Check one: ☐ Dr. ☐ Mr. ☐ Ms.	Family Name		
	First Name		Sex: ☐ M ☐ F
Street address			
City	Province	Postal Code	
Office Telephone ( )	Home Telephone ( )		
Fax ( )	CDA Membership Number		

LIMITED ATTENDANCE COURSES

Saturday, August 17th —

David S. Hornbrook — Mastering Aesthetics and Adhesion: Dental Care for the 21st Century — All day lecture
- Dentist ..... $135 _____
- Dental Staff (non-dentist) ..... $ 65 _____

Louis Touyz — A New Look at Periodontics in the Nineties — All day lecture
- Dentist ..... $135 _____
- Dental Hygienist ..... $ 65 _____

Sunday, August 18th —

William Blatchford — Presenting Ideal Treatment and Getting a Yes! — All day lecture
- Dentist ..... (7% GST included) $135 _____
- Dental Staff (non-dentist) ..... (7% GST included) $ 65 _____

GST is included in the Limited Attendance Practice Management courses. GST is not charged on Limited Attendance and Hands-on scientific courses.

Lunch is included in all day Limited Attendance and Hands-on courses.

***NOTE:** Every dentist enrolled for the Convention can register two (2) non-dentist staff members for the convention proper FREE OF CHARGE. The first or second non-dentist staff member to register *with* a dentist, choose "Registration Fees" Nil. Send Registration Form with that of the dentist.

HANDS-ON WORKSHOPS

Saturday, August 17th & Sunday, August 18th —

Pierre Boudrias — Implants: Basic Prosthetic Certification Course — Two day hands-on workshop
- Dentist (limited to 50 participants) ..... $295 _____

Sunday, August 18th —

Herbert I. Bader & Jane Jones — Scaling and Root Planing — Half day hands-on workshop
- Dentist/Dental Hygienist (limited to 40 participants) .. $ 115 _____

Gary Glassman & Kenneth Serota — Endodontic Impressionism: A Palette for Excellence — All day hands-on workshop
- Dentist (limited to 40 participants) ..... $ 195 _____

CONVENTION

Choose only one delegate type. 1 registrant per form.

☐ **Dentist**
- Member of CDA ..... $ Nil _____
- Non-member of CDA ..... (7% GST included) $175 _____
- ☐ I will attend the Young Dentist Program (Graduate 1986-96) ..... $ Nil _____
  - My year of Graduation _____

☐ **Spouse** ..... (7% GST included) $ 98 _____

☐ **Dental Hygienist** ..... (7% GST included) $ 98 _____
Dental Hygienist (See note below)* ..... $ Nil _____

☐ **Dental Assistant** ..... (7% GST included) $ 98 _____
Dental Assistant (See note below)* ..... $ Nil _____

☐ **Office Personnel, Office Manager, Receptionist** ..... (7% GST included) $ 98 _____
Office Personnel, Office Manager, Receptionist (See note below)* ..... $ Nil _____

☐ **Dental Technician** ..... (7% GST included) $ 98 _____

☐ **Student Dentist** ..... $ Nil _____
☐ **Student Dental Hygienist** ..... $ Nil _____
☐ **Student Dental Assistant** ..... $ Nil _____

* Students must provide proof of full-time attendance.

Are you the person or one of the persons responsible for purchases in the office? ☐ **Yes**

GST Registration Number: R106845209

SOCIAL EVENTS

☐ **Opening Ceremony** — Sunday, August 18th
(Subject to space availability — One ticket per Registration Form)
Will attend ☐ Yes ☐ No ..... $ Nil _____

☐ **Meet & Greet** — Sunday, August 18th
..... (7% GST included) $ 55 _____

☐ **President's Gala** — Dinner Cruise — Monday, August 19th
..... (7% GST included) $ 75 _____

☐ **Golf Day** — Sunday, August 18th
..... (7% GST included) $125 _____

☐ **Fun Run** — Tuesday, August 20th a.m.
..... (7% GST included) $ 25 _____

☐ **Visits and Tours** (See page 14 for details)
City Tour — August 17 ..... (7% GST included) $ 50 _____
Old Montréal — August 18 ..... (7% GST included) $ 50 _____
Knowlton — August 19 ..... (7% GST included) $ 50 _____
Shopping — August 20 ..... (7% GST included) $ 50 _____

☐ **Children (6-12 years)** Child's Age:_____
Sunday program ..... (7% GST included) $ 48 _____
Monday program ..... (7% GST included) $ 48 _____
Tuesday program ..... (7% GST included) $ 48 _____

TOTAL (ALL sections) ..... $ _____

Person/company
responsible for payment: _____

☐ I wish to pay the above total by credit card:

☐ MasterCard ☐ VISA

Card # _____

Expiry Date _____

Name of Cardholder _____

SIGNATURE _____

☐ I enclose a cheque payable to the Canadian Dental Association.
Post-dated cheques will not be accepted.

CANCELLATION POLICY:

- Cancellation received, in writing, on or before July 26, 1996 — full refund
- Cancellation received, in writing, after July 26, 1996 — subject to a 25% administrative charge

NO REFUND AFTER AUGUST 10, 1996

☞ INFORMATION ON REGISTRATION:

All participants registered for the Convention:

- have access to all general lectures of the Convention proper
- have access to the exhibit hall
- have access to the Opening Ceremony
- are entitled to register for the appropriate limited attendance lectures and hands-on courses
- are entitled to register for social events, visits and tours

Spouses and children have access to the Opening Ceremony only if they register for one or more of the Convention's day programs or if registered for the Convention. Spouses not registered for the Convention do not have access to the general lectures or to the exhibit hall.

To ensure that your requests are met — ***please register early***. Advance registrations will be accepted until **July 26th, 1996** after which date forms will be returned to the sender. Each on-site registration will be subject to a $30 administrative fee (GST included).

HOTEL RESERVATION

Type of Room:
☐ Single ☐ Double ☐ Twin ☐ Other (please specify)

_____

☐ Smoking ☐ Non-Smoking

Special Requests: _____

_____

Sharing with _____

Indicate your choice of hotel* (by numbering the boxes):
☐ Montréal Bonaventure Hilton ..... $149.00 single/double
☐ Queen Elizabeth ..... $148.00 single/double
☐ Château Champlain ..... $135.00 single/double
☐ Radisson/Auberge des Gouverneurs ..... $120.00 single/double
☐ Novotel ..... $106.00 single/double

* Prices do not include taxes.

Arrival Date: _____

Arrival Time: _____

Departure Date: _____

All changes and/or cancellations must be made **IN WRITING** through CDA Conventions. Fax to (613) 523-3062.

In order to reserve a room, a guarantee for the first night is essential. The guarantee will apply to the first night ONLY. To cancel your reservation advise CDA Conventions at least three (3) days prior to your projected arrival date.

CHEQUES WILL NOT BE ACCEPTED.

☐ MasterCard ☐ American Express ☐ VISA

Card # _____

Expiry Date _____

Name of Cardholder _____

SIGNATURE _____

DEADLINE for Reservations: July 26, 1996

ACCOMMODATION

☐ I do not require accommodation
☐ Other arrangements have been made

MAIL Pre-registration and Hotel Reservation Form with payment to:

1996 CDA Convention
1815 Alta Vista Drive
Ottawa, Ontario K1G 3Y6

OR FAX

(if paid by credit card): (613) 523-3062

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CHILDREN'S PROGRAM

SUNDAY, AUGUST 18 — Mount Royal, IMAX Theatre & Sports Magician Museum

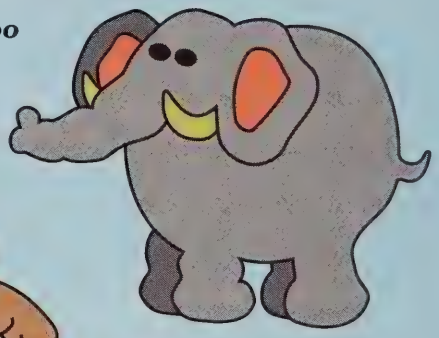
Under supervision, the children will venture out on a morning nature walk on Mount Royal, the most popular green space in the city. Mount Royal is an ideal location for an adventurous trek on the trails.

The afternoon begins with a show at the exciting IMAX Theatre. The 3-D feature film is entitled, "Across the Sea of Time" and is sure to captivate the young minds.

The rest of the afternoon will be spent at Sports Magician Museum, a museum dedicated to the history of Olympic and professional sports with a large number of interactive learning exhibits.

MONDAY, AUGUST 19 — Granby Zoo

The Granby Zoo is a sure delight for children of all ages.



There are more than 750 animals to see with a wonderful variety of African mammals, big cats, exotic birds and reptiles representing 220 wildlife species from all continents. In addition, more than 85 different endangered species make their home at the Granby Zoo. The children can also enjoy several rides at the zoo.

TUESDAY, AUGUST 20 — Surprise Breakfast, La Ronde & "Mystery" Science Lecture

The fun lasts even up to the final day of the Convention! To set the theme for the day, the children will have breakfast together and with special guests! Later in the morning, the children will go to La Ronde, Québec's largest amusement park with more than 34 rides.

The afternoon will end with Dr. Joe Schwarcz, a very well-known chemist who loves to mix magic and science. Dr. Schwarcz has an astonishing magic performance that captivates not only children but even the most knowledgeable of adult audiences.

ALL CHILDREN'S OUTINGS ARE FULLY SUPERVISED AND INCLUDE A LUNCH AND SNACKS.

FDI 1996 & Out-of-Country Dental Seminars

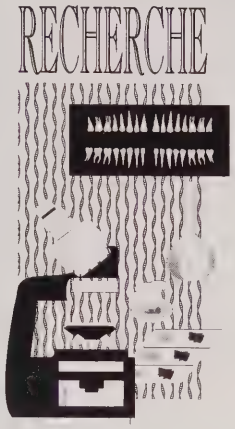
The 1996 World Dental Congres will be held in the exciting city of Orlando, Florida from September 28 to October 1. The CDA has designed (in cooperation with Tourcan Vacations) pre- and post-congress tours to complement FDI 1996. CDA member dentists may take advantage of the following tours:

- Gulf of Mexico Cruise (September 23 - 27)
- Walt Disney World (October 2 - 6)
- Galapagos Islands (October 2 - 10)
- Costa Rica (October 2 - 11)

In addition, Out-of-Country dental seminars to foreign destinations have also been planned. The remaining tour for the 1996 year is:

- Morocco (June 29 - July 14)

For more information, contact CDA Conventions at 1-800-267-6354.



Manifestations bucco-dentaires de la leucémie chez l'enfant

Mandana Nikoui, DMD, Cert. Dent. Pédiat.

Benoît Lalonde, DMD, MSD

SOMMAIRE

Chaque année, on dénombre au Canada environ un millier de cas de cancer chez les enfants de la naissance à l'âge de 14 ans. La leucémie compte pour environ 30 pour cent de ces nouveaux cas. Plus que tout autre type de cancer, la leucémie et son traitement sont susceptibles de causer chez l'enfant des complications buccales. La condition leucémique en soi ainsi que la thérapie provoquent des signes et des symptômes buccaux possédant une morbidité importante. L'espérance de vie pour un patient leucémique s'étant grandement améliorée, le dentiste est de plus en plus appelé à jouer un rôle actif avant, durant et après le traitement antileucémique. Nous vous proposons une revue des manifestations bucco-dentaires associées à la leucémie et à son traitement.

ABSTRACT

Every year in Canada, approximately one thousand cancer cases are reported in children from birth to age 14. Leukemia accounts for approximately 30 per cent of these cases. Leukemia and its treatment are likely to cause to children more oral complications than all other types of cancer. Both the leukemic condition itself and the therapy cause oral signs and symptoms with significant morbidity. Since life expectancy for a patient with leukemia has been greatly improved, dentists have an increasing role to play before, during and after a treatment against leukemia. A review of the oral manifestations related to leukemia and its treatment is presented.

Introduction

Le cancer est l'une des causes majeures de mortalité chez l'enfant et affecte plus d'un enfant sur six milles, entre la naissance et 14 ans.[1] Cependant, la leucémie lymphoblastique aiguë se trouve en tête de liste comptant pour 30 pour cent de ceux-ci.[1,2] Un enfant atteint de leucémie est susceptible de souffrir d'atteinte buccale de façon plus fréquente et importante que n'importe quel autre type de cancer.[3] Grâce aux méthodes de traitement, l'espérance de vie de ces enfants est augmentée tout comme les séquelles et les perturbations générales et bucco-dentaires reliées à ces thérapies. Cela implique la nécessité d'évaluer ces problèmes et d'appliquer des mesures préventives et/ou palliatives afin de les éviter ou de les réduire le plus possible, tout particulièrement, chez les sujets en pleine période de croissance et de développement.[4]

La nature et le degré de complications bucco-dentaires semblent dépendre de plusieurs facteurs tels que le type de cancer, l'âge du patient, la localisation et la dose de la radiothérapie, le fractionnement ou non d'une dose totale de radiothérapie, la dose et le moment choisis pour la chimiothérapie, la prophylaxie contre les candidoses, l'herpès et autres agents pathogènes, la condition bucco-dentaire pré-existante et le niveau de soins buccaux durant le traitement.[5] Cet article se veut un résumé des manifestations orales de la leucémie pédiatrique et des effets bucco-dentaires reliés à sa thérapie.

Définition, étiologie, classification, diagnostic et traitement

La leucémie est une hémopathie maligne, caractérisée par l'accumulation dans l'organisme de cellules immatures ou «blastes», ainsi que d'une insuffisance de la moelle osseuse à produire des cellules différenciées des lignées myéloïdes et lymphoïdes normales.[6] En effet, les blastes ou cellules leucémiques envahissent divers organes et, plus particulièrement, la moelle osseuse au point de gêner la multiplication des cellules sanguines normales.[6] L'étiologie est inconnue, mais certains facteurs peuvent contribuer à son développement.[7-9] Des facteurs génétiques (anomalies chromosomiques: trisomie 21, anémie de Fanconi, syndrome de Turner), environnementaux (radiation, substances chimiques, virus) ainsi qu'immunologique ont, entre autres, été proposés comme étant des conditions prédisposantes au développement de la leucémie. Parallèlement, la leucémie se divise en deux groupes, aiguë et chronique, suivant le degré de maturation des cellules et le temps

de survie du patient, et en plusieurs sous-groupes suivant le type de cellules leucémiques impliquées. Chez l'enfant, la forme aiguë est prédominante et la forme lymphoblastique compte pour 80 pour cent des cas de leucémie.[2,7]

Le diagnostic de la leucémie est, dans la majorité des cas, facile à établir: un examen de la moelle osseuse en révèle la présence. Mais le succès du traitement de la leucémie demeure plus difficile à déterminer. L'arme privilégiée actuellement est la chimiothérapie, à laquelle on associera la radiothérapie crânienne et, advenant une rechute et une deuxième rémission complète, la transplantation de la moelle osseuse. Cependant, les complications associées à ces thérapies figurent parmi les causes majeures de mortalité chez ces patients.[8] En somme, la chimiothérapie est le traitement des patients leucémiques. Par contre, la plupart des enfants leucémiques ont une atteinte sub-clinique du système nerveux central au moment du diagnostic. Ce phénomène justifie l'utilisation de chimiothérapie intrathécale, associée ou non à la radiothérapie, appliquée au niveau du cerveau afin d'éviter une complication fréquente de cette maladie: la leucémie du système nerveux central ou *méningite leucémique*.[2,9] Par contre, dans le cas où la transplantation de la moelle osseuse s'avère indispensable, l'irradiation corporelle totale est préférable.[2]

Considérations cliniques

Le **Tableau I** décrit les différents signes et symptômes locaux et systémiques associés à la leucémie. Il est impératif de reconnaître la maladie à un stade précoce, car la leucémie, surtout de type aiguë, peut être monosymptomatique au début et ne se manifester qu'occasionnellement par des signes buccaux[7] (**Fig. 1**). D'autre part, les traitements antitumoraux rendront le patient susceptible aux complications bucco-dentaires. Ceci implique des soins avant, pendant et après le traitement antileucémique afin de limiter l'atteinte au niveau de la cavité buccale.[8] Les complications bucco-dentaires reliées au traitement de la leucémie sont multiples. Elles sont essentiellement causées par la chimiothérapie, mais également par la radiothérapie (principalement dans les cas d'irradiation corporelle totale) ou les deux à la fois.

Tableau I

Signes locaux et systémiques associés à une leucémie

Signes de prolifération blastique
• adénopathies cervicales
• hypertrophie gingivale
• hypertrophie glandulaire
• odontalgie (le plus souvent sans cause locale apparente et serait due à l'infiltration blastique de la pulpe dentaire conduisant à un abcès dentaire)
• perte dentaire suite à l'atteinte osseuse en passant par des mobilités dentaires
• paresthésie de la face, de la lèvre ou de la langue
Signes d'insuffisance médullaire
• anémie avec pâleur et asthénie
• granulopénie avec fièvre et infection
• thrombocytopénie avec purpura de la muqueuse buccale, des pétéchies sous muqueuses et des gingivorragies
• gingivostomatites ulcéreuses ou ulcéronécrotiques de la gencive ou de la muqueuse buccale qui sont souvent les signes précoces d'une infection secondaire à la leucopénie

Problèmes bucco-dentaires communs à la radiothérapie et la chimiothérapie

Stomatites et Ulcérations

C'est la complication la plus souvent rencontrée suite aux thérapies anticancéreuses[5,10-15] et de plus grande importance chez les enfants comparativement aux adultes en raison de la fréquence plus élevée de divisions cellulaires.[10,12,16,17] La production de radicaux libres, engendrée par la radiothérapie, amène des changements au niveau de l'ADN.[18] Les agents cytotoxiques agissent au niveau des cellules en pleine prolifération aussi bien normales que leucémiques.[19] Ainsi, l'épithélium de la muqueuse buccale est très rapidement atteint au niveau des cellules basales d'autant plus qu'elle n'est pas kératinisée. Tout cela conduit à la perte d'intégrité de la barrière épithéliale et à la formation d'ulcérations qui peuvent s'infecter secondairement dû à la neutropénie induite par ces agents thérapeutiques.[10,12,14,16,17] On sait également que le cycle de transformation des cellules épithéliales varie en fonction du site de la cavité buccale.[17] Des études faites sur des primates ont démontré que la muqueuse du palais mou, de la surface ventrale de la langue ainsi que de la muqueuse jugale, se divisent plus rapidement que la muqueuse de la gencive ou du palais dur.[20] Cette observation est corroborée par la prévalence plus importante d'ulcérations sur les surfaces non-kératinisées comparativement aux surfaces kératinisées.[21] Cliniquement, les muqueuses paraissent érythémateuses et les zones les plus affectées sont le palais mou, le pharynx, la muqueuse buccale et les tissus sublinguaux.[5,14] Par la suite, les ulcérations apparaissent au niveau des lèvres, des muqueuses buccales et de la langue. Elles sont en général, très douloureuses et empêchent l'enfant de s'alimenter normalement.[5,10,14,16,17]

Le tissu conjonctif est également atteint et on note une hypovascularisation et une ischémie qui sont caractérisées par l'érythème féroce observé dans les cas de radiothérapie.[18] La mucosite et les ulcérations buccales sont habituellement observées lorsque la leucopénie est au plus

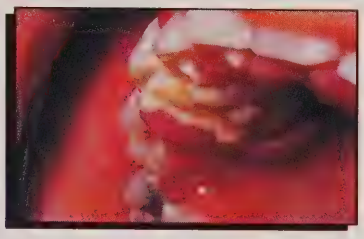


Fig. 1: Infiltration blastique de la muqueuse palatine.

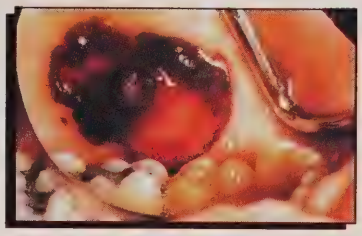


Fig. 2: Hématome de la joue causée par la thrombocytopénie secondaire à la chimiothérapie.

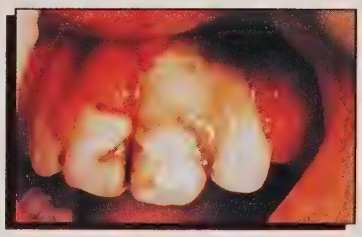


Fig. 3: Lésion gingivale nécrotique chez un patient immunosupprimé par la chimiothérapie. La culture confirma une infection bactérienne causée par le pseudomonas.

fort et a tendance à disparaître lorsque le compte de neutrophile absolu retourne à la normale.[5]

Xérostomie

À la fois la chimiothérapie et la radiothérapie affectent les glandes salivaires entraînant enflure, douleur et xérostomie. Les patients peuvent éprouver de la difficulté à s'alimenter, avaler et parler. La sécheresse buccale induite par la chimiothérapie est de courte durée et souvent réversible contrairement à celle de la radiothérapie.[14-16,22,23] Les modifications qualitative et quantitative du flot salivaire associées à une prolifération bactérienne produisent un milieu favorable au développement de décalcification dentaire et/ou de carie ("chémocarie") similaires à celles apparaissant à la suite de l'irradiation de la région cervicofaciale.[15,16] Par exemple, l'état hyposialique entraîne une réduction de la capacité tampon de la salive ainsi que d'immunoglobulines (IgA). Combinés au fait que le patient peut vomir fréquemment, on réalise le risque important à développer la carie dentaire.[16]

Chez les adultes et les enfants plus âgés, la radiothérapie corporelle totale en doses fractionnées cause des symptômes salivaires qui disparaissent habituellement après 48 heures. Par contre, les patients d'âge prépubertaire ne souffrent habituellement pas de symptômes salivaires lorsque traités en doses fractionnées.[5]

Problèmes bucco-dentaires reliés à la radiothérapie

Chez les enfants leucémiques, la radiothérapie ne cause généralement pas de problèmes bucco-dentaires majeurs car elle est appliquée principalement à titre prophylactique, donc à faibles doses, habituellement 1800 cGy fractionnés en 10 séances. Par contre, appliquée en doses massives, comme c'est le cas pour l'irradiation corporelle totale, en plus des manifestations précitées, elle causera les conséquences suivantes:[15,22,24]

- malformation faciale par atteinte osseuse
- stomatite nutritionnelle
- anomalies dentaires et caries
- perte de goût
- ostéoradionécrose
- trismus

Anomalies dento-faciales

Les conséquences cliniques, surtout chez les enfants en bas âge, dépendent du stade de développement dentaire,[25] et se manifestent sous les formes suivantes:

- amélogénèse imparfaite: hypoplasie améllaire et sensibilités dentinaires associées
- microdontie, agénésies ou malformations dentaires ou radiculaires,
- racines plus courtes et /ou plus minces que la normale avec une fermeture apicale précoce.[16,22,26,27]

Au niveau squelettique, l'atteinte s'observe sous forme de micrognathie, de rétrognathie et de malocclusion.[28]

Problèmes bucco-dentaires reliés à la chimiothérapie

Les agents antitumoraux ont une toxicité médullaire qui provoque des leucopénies, des thrombocytopénies et des anémies suite à l'aplasie médullaire profonde.[13,15] Elle prévaut surtout dans les phases d'induction des leucémies.[13]

Hémorragie

L'hémorragie intrabuccale représente une autre complication de la chimiothérapie que peut entraîner une réduction importante de la production des plaquettes par les mégacaryocytes.[12] La thrombocytopénie, qui en résulte, est responsable d'approximativement 80 pour cent des hémorragies, des hématomes et des pétéchies intrabuccales.[5,10,16,22] L'hémorragie spontanée survient surtout si le nombre des plaquettes est inférieur à 20,000/mm^3.[10,13] Tandis que les saignements buccaux sont rares lorsque le taux de plaquettes est au-delà de 50,000/mm^3, les chances excèdent 50 pour cent lorsque le niveau est inférieur à 30,000/mm^3.[22] Elle débute au niveau des gencives surtout si l'hygiène est mauvaise mais aussi au niveau des lésions ulcérées[5,10,13,14,29] (**Fig. 2**).

Infections

La chimiothérapie induit la suppression des cellules impliquées dans la défense de l'organisme (granulocytes et lymphocytes) qui, en temps normal, assurent la défense de celui-ci et le bon fonctionnement du système immunitaire. Ainsi, durant et après cette période d'immunosuppression, les patients sont à haut risque pour toute infection bactérienne, fongique et/ou virale.[10,15,16,22,29]

Infection fongique

Les candidoses orales sont très fréquentes chez les leucémiques et se manifestent surtout lors de la prise d'antibiotiques et de stéroïdes.[5,14,22,23,30] Chez les enfants, elles apparaissent surtout au niveau de la muqueuse jugale, de

Fig. 4: Herpès labial chez un patient en cours de traitement pour une leucémie lymphoblastique aiguë.

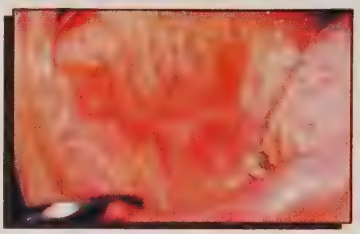


Fig. 5: Réaction lichénoïde caractéristique de la réaction du greffon contre l'hôte (de type chronique) chez un patient ayant reçu une transplantation de moelle osseuse allogénique.

la langue et de la gencive.[14] Une des complications graves de celles-ci est le développement de candidoses systémiques surtout si le patient est neutropénique.[5,10,14] Wahlin a démontré que la chimiothérapie peut occasionner une hyposialie temporaire et que cette dernière est étroitement reliée au risque de développer une infection fongique buccale.[23] De plus, de part leur effet anticholinergique, l'utilisation d'agents antiémétique peut également causer un état de sécheresse buccale augmentant le compte de *candida albicans*.[23]

Infection bactérienne

La neutropénie, créée par ces thérapies, rend le patient très vulnérable aux infections bactériennes.[14] La septicémie est la cause la plus importante de mortalité chez ces patients.[15] On considère qu'entre 25 pour cent et 54 pour cent des cas de septicémie chez les patients cancéreux, souffrant de neutropénie, proviendraient d'un foyer d'infection buccal.[31] Les principaux agents responsables sont les bacilles gram négatifs: pseudomonas et klebsiella et les bacilles gram positifs: staphylococcus aureus et epidermidis[5,10,30,32] (**Fig. 3**). Parmi les complications infectieuses, celles de la muqueuse buccale seraient initiées par les foyers inflammatoires gingivo-dentaires chroniques pré-existants. Les petites érosions de la muqueuse sont les points de départ de larges ulcérations et de nécroses dont le développement est provoqué par l'aplasie médullaire profonde, par l'atrophie de l'épithélium buccal et par la surinfection.[13] Il est de plus essentiel que toute dent possédant un potentiel infectieux, e.g. nécrose pulpaire ou une carie atteignant la pulpe, soit extraite au moins 10 jours avant le début du traitement anticancéreux.[5]

Infection virale

Cette infection se manifeste essentiellement par l'herpès simplex virus de Type 1 (VHS 1) surtout si le virus existe déjà sous forme latente et peut donc être réactivé par l'état d'immunosuppresison[5,10-12,14,15] (**Fig. 4**). Il est très difficile de faire le diagnostic différentiel entre les stomatites et l'infection virale. Contrairement à ce qui est noté chez les patients immunocompétents, les lésions récidivantes d'herpès simplex peuvent atteindre n'importe quel site de la cavité buccale et non seulement atteindre les muqueuses non-mobiles.[4,5,22] Les lésions ulcératives nécessitent souvent un prélèvement pour déterminer le diagnostic.[5,14] L'infection buccale peut s'étendre vers d'autres sites et causer par exemple une oesophagite, une trachéite ou une pneumonie.[5,10] Fait important à noter, les signes habituels d'inflammation tels que l'érythème, l'oedème ou la douleur peuvent être réduits ou même absents durant des phases d'immunosuppression sévère, ce qui peut brouiller le tableau clinique et retarder le diagnostic final d'un phénomène infectieux.[5,14,33]

Anomalies dentaires

Bien que les effets de la radiothérapie sur le développement dento-squelettique soient bien documentés, on a cru que la chimiothérapie ne causerait pas de problèmes au niveau squelettique ou dentaire. Une étude publiée en 1984 démontra que l'utilisation unique d'agents chémothérapeutiques semblait causer des dysmorphismes dentaires.[34] Rosenberg rapporta de façon significative, par son suivi de 17 patients ayant été traités uniquement par chimiothérapie, qu'on pouvait noter, entre autres, un raccourcissement de la longueur des racines ainsi qu'un amincissement de la portion apicale de certaines dents.[16,26,27]

Problèmes bucco-dentaires reliés à la transplantation de la moelle osseuse

La transplantation de la moelle osseuse (TMO) occupe une place de plus en plus importante dans le traitement des leucémies. Elle est fortement envisagée dans les cas de leucémies à haut risque, au moment d'une deuxième rémission complète et dans les cas de déficiences immunitaires.[8,35] Ces transplantations demandent un don adéquat (transplantation allogénique ou autologue) et des thérapies lourdes impliquant souvent l'irradiation corporelle totale et/ou la chimiothérapie afin de limiter au maximum le risque de rejet et de détruire la maladie primaire.[2,36] En général, les manifestations cliniques sont les conséquences directes de la neutropénie prolongée et dans les cas de transplantations allogéniques, de la réaction du greffon contre l'hôte. Cette réaction est due au fait que les lymphocytes T du donneur reconnaissent les cellules de l'hôte comme étrangères et les attaquent sans que celles-ci soient capables de se défendre du fait de l'immunosuppression complète. Ceci est d'autant plus grave lorsqu'il y a une discordance entre les antigènes HLA du donneur et ceux du receveur.

Les manifestations cliniques buccales de la réaction du greffon contre l'hôte sont notées sous forme d'érythème ou d'atrophie des muqueuses, de présence de lésions lichénoïdes (**Fig. 5**), de xérostomie, et de douleur pendant la mastication ou le brossage.[35,37]

Conclusion

Les complications orales chez l'enfant leucémique sont celles qui surviennent essentiellement à la suite des thérapies anticancéreuses, tout particulièrement la chimiothérapie. Toutefois, étant

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donné que les enfants sont en période de croissance, ces traitements créent des problèmes additionnels, surtout à long terme. La nature et la sévérité des séquelles dépendent de plusieurs facteurs dont le type et le dosage de la radiothérapie ainsi que des agents chimiothérapeutiques utilisés. Les études ont démontré que moins de problèmes buccaux se développent si, au préalable, on a pris soin d'éliminer toutes les pathologies bucco-dentaires et que l'on maintient une hygiène orale optimale pendant la chimiothérapie.[12,14,16,22,33]

Dahllof et ses collègues ont démontré que 41 pour cent des enfants évalués, en prévision d'une transplantation de moelle osseuse, nécessitaient des traitements dentaires avant l'induction, ce qui démontre l'importance d'une évaluation bucco-dentaire.[38] Les études ont également démontré que les enfants traités pour un cancer sont plus susceptibles à développer des caries, à souffrir d'anomalies dentaires et à souffrir d'inflammation gingivale lorsque comparés à des groupes contrôles.[39-41]

La leucémie lymphoblastique aiguë, qui constitue 80 pour cent des leucémies chez l'enfant, est guérie dans 70 pour cent des cas à l'aide de la chimiothérapie.[9] Des améliorations spectaculaires ont été notées depuis la fin des années 40, passant d'une durée moyenne de survie de trois mois à un taux actuel de rémission complète de 95 pour cent, avec plus de 55 pour cent en rémission continue après cinq ans.[5] Pour cette raison, la profession dentaire est de plus en plus sollicitée pour l'évaluation de ces patients avant le traitement antileucémique ainsi que dans le suivi à court, moyen et long terme. De plus, les enfants traités pour une leucémie sont sept fois plus susceptibles de développer un cancer et 22 fois plus à risque à développer des tumeurs du système nerveux central lorsque comparés à la population en général.[9] Compte tenu de ce risque accru à développer une nouvelle tumeur primaire, il est conséquemment essentiel d'assurer un suivi médical et bucco-dentaire chez ces patients.[4] ■

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Demandes de tirés à part: Dr Benoît Lalonde, professeur adjoint, Université de Montréal, Faculté de médecine dentaire, Département de stomatologie, C.P. 6128, Succ. Centre-ville, Montréal, QC H3C 3J7.

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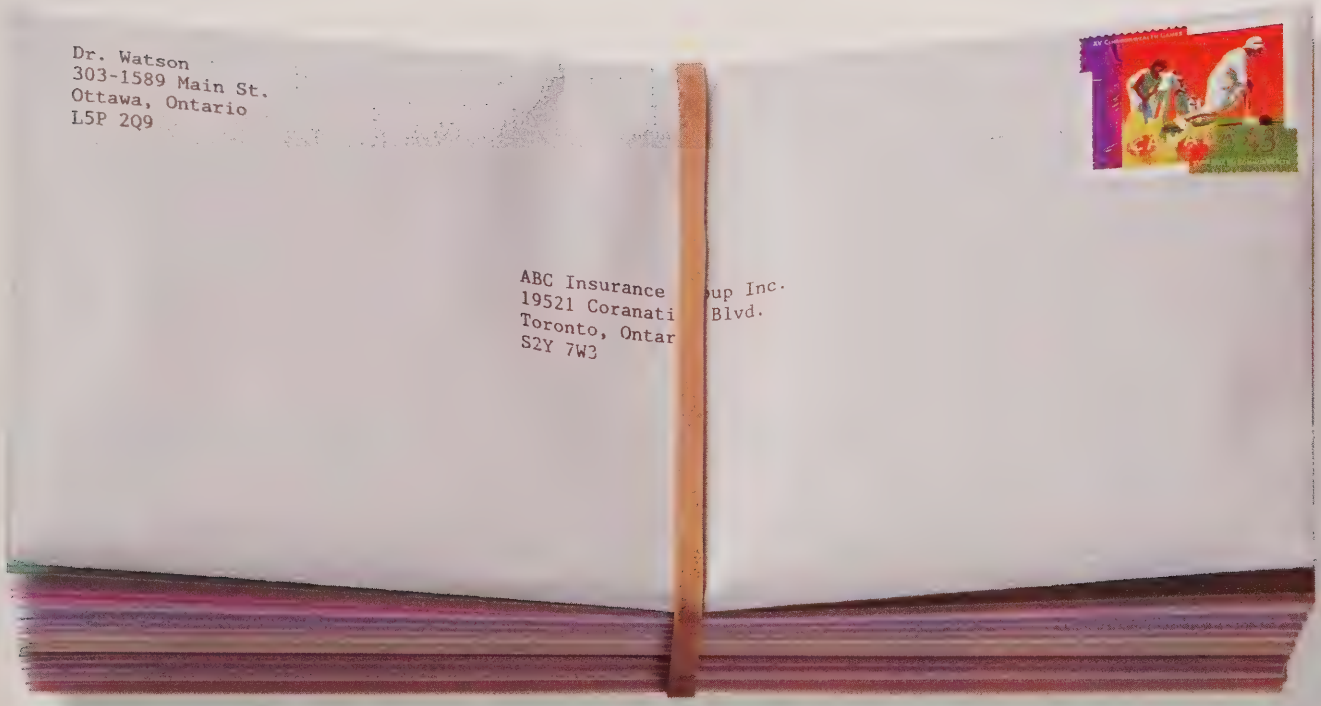

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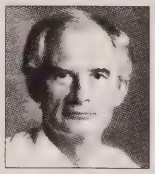

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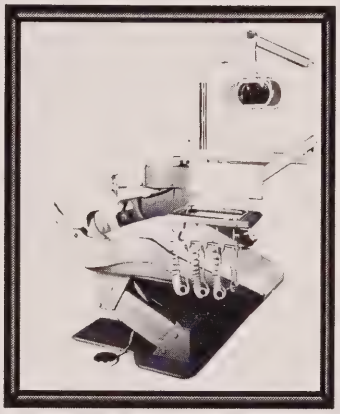

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INTERNATIONAL

June 18-22

Turkish Dental Association's 3rd International Dental Congress in Ankara, Turkey. Tel: 0 312 479 8924, or fax: 0 312 474 79 25.

July 11-13

International Women's Dental Conference in Melbourne, Australia. "Enhancing the balance both personally and professionally." Contact Amanda Lawrence, 3 Railway Walk, Hampton 31188, Australia. Tel.: (03) 9521 6500, or fax: (03) 9521 6501.

August 10-16

43rd World Congress of Young Dentists Worldwide (YDW) and International Association of Dental Students (IADS) in Göteborg, Sweden. Contact the IADS & YDW Congress Committee, Odontologen, Medicinaregatan 12 a, 8, 413 90 Göteborg, Sweden. Tel.: +46(0)31 773 32 08, or fax: +46(0)31 773 32 07.

August 19-23

21st North Queensland Dental Convention in Cairns, Australia. Contact Peter Martin, North Queensland Dental Convention, P.O. Box 388, Cairns 4870, Australia. Tel.: (070) 51 2351, or fax: (070) 31 2351.

August 21-24

2nd World Congress of Hungarian Dentists in Budapest, Hungary. Contact the Congress office of MATE, Ms. Zsuzsa Pintér, Budapest, P.O.B. 451, H-1372. Tel.: (36-1) 1329-571, or fax: (36-1) 1531-406.

September 4-8

18th Biennial Conference of the New Zealand Dental Association — Tomorrow's Dentistry Today in Rotorua, New Zealand. Contact the NZDA Conference Secretary, Dr. Roger Ayers, 19 Pukaki St., Rotorua, New Zealand. Tel.: +64 7 348 5385, or fax: +64 7 348 6788.

September 28 - October 1

FDI 1996 — 84th World Dental Congress in Orlando, Florida. Contact Laura Stephenson. Tel.: (613) 523-1770 ext. 246 or 1-800-267-6354.

October 5-8

International Conference on Stress and Health — ISMS 6 in Sydney, Australia. Contact F.J. McGuigan, Institute for Stress Management, 10455 Pomerado Rd., San Diego, Calif. 92131. Tel.: (619) 635-4698, or fax: (619) 635-4669. Internet: NOSTRESS@sanac.USIU.edu.

CANADA

June 1

Esthetic Dentistry. Presenter: Dr. William Dickerson. Course co-sponsored with Aurum Ceramic Dental Laboratories. Contact Continuing Education, Faculty of Dentistry, Dalhousie University, Halifax, Nova Scotia B3H 3J5. Tel.: (902) 494-1674, or fax: (902) 494-2527.

June 6-8

University of Toronto's faculty of dentistry — **Root Canal Filling by Vertical Condensation of Warm Gutta-Percha.** Contact Continuing Education, Faculty of Dentistry, University of Toronto, 124 Edward St., Toronto, Ont. M5G 1G6. Tel.: (416) 979-4902, ext.: 4389.

June 7-9

Canadian Dental Hygienists' Association 7th Annual Professional Conference — "Interdependence and Independence: Striking a Balance." Contact Janice Edgar. Tel.: (613) 221-5515, or fax (613) 224-7283.

July 6

HIV Prevention Works — a satellite symposium of the XI International Conference on AIDS in Vancouver, B.C. Contact the Canadian Public Health Association, 400-1565 Carling Ave., Ottawa, Ont. K1Z 8R1. Tel.: (613) 725-3769, or fax: (613) 725-9826.

July 23-26

8th International Congress of the International Association of Oral Pathologists in Toronto. Contact the Congress Office, P.O. Box 1570, 190 Railway St., Kingston, Ont. K6L 5C8.

August 17-20

Canadian Dental Association 1996 Convention in Montreal. Scientific sessions, exhibit hall, social events, special activities, spouse's program and children's program. Contact Laura Stephenson. Tel.: (613) 523-1770, ext. 246, 1-800-267-6354, or fax: (613) 523-3062.

August 17-20

Annual Convocation and Meeting of the Canadian Section of the International College of Dentists in Montreal, Que. Contact the Canadian Section of ICD, 12A Yonge Blvd., Suite 1, Toronto, Ont. M5M 3G5.

August 17-22

8th World Congress on Pain in Vancouver, B.C. Sponsored by the International Association for the Study for Pain (IASP). Contact the IASP Secretariat, 909 N.E. 43rd St., Suite 306, Seattle, Wash. 98105, U.S.A. Tel.: (206) 547-6409, or fax: (206) 547-1703.

September 7-8

Royal College of Dentists of Canada Convocation, Annual Dinner and Annual Meeting in Montreal, Que. Contact Kay Montgomery, tel.: (416) 929-2722, or fax: (416) 929-5924.

October 2-6

32nd Annual Meeting of the Canadian Academy of Endodontics in Kelowna, B.C. Contact Dr. W.J. Froese, tel.: (604) 763-0855, or fax: (604) 763-1124.

October 3-5

Canadian Association of Orthodontists Annual Scientific Session, in Toronto, Ont. Contact Diane Gaunt. Tel. (416) 491-3186, or fax: (416) 491-1670.

October 25-26

Thompson Okanagan Dental Society Annual Meeting and Convention in Kelowna, British Columbia. Contact: Lane Shupe, tel./fax: (604) 764-2247.

November 1-2

Southern Ontario Surgical Orthodontic Study Group will meet in Windsor. Contact Dr. Jeff Berger. Tel: (519) 258-2632, or fax: (519) 258-2637.

U.S.A.

June 13-16

1996 Annual Symposium of the Office Sterilization and Asepsis Procedures (OSAO) Research Foundation in Dallas, Texas. Contact the OSAP Central Office, P.O. Box 6297, Annapolis, Md. 21401. Tel.: (410) 798-5665 or 1-800-298-6727, or fax: (410) 798-6797.

July 25-27

10th National Conference on the Young Dentist — A Decade of Excellence, in Cleveland, Ohio. Contact the American Dental Association Committee on the New Dentist. Tel.: (312) 440-2779.

September 5-6

Second Annual Conference on Geriatric Oral Health — Dentistry and Drugs in the Elderly — in Ann Arbor, Michigan. Contact the University of Michigan's office of continuing dental education. Tel.: (313) 763-5070.

September 25-27

59th Annual Meeting of the American Association of Public Health Dentistry in Orlando, Florida. Contact the AAPHD National Office, 10619 Jousting Lane, Richmond, Va. 23235-8344. Tel.: (804) 272-8344, or fax: (804) 272-0802.

November 4-5

American Board of Oral and Maxillofacial Radiology — 1996 Certifying Examination in San Diego, California. Applications must be received by May 3, 1996. Contact Dr. R. Curtis Lundeen, Oral Radiology, Oregon Health Sciences University, School of Dentistry, 611 S.W. Campus Dr., Portland, Ore. 97201-3097. Tel.: (503) 494-8930.

DENTAL MEETINGS

June 6-9

Alberta Dental Association Annual Meeting and Convention in Kananaskis. Tel.: (403) 432-1012.

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Nova Scotia Dental Association Annual Meeting in Baddeck. Contact Steve Jennex. Tel.: (902) 420-0088.

August 17-20

Annual Meeting of the CDA Board of Governors, in Montreal. Contact Suzanne Burton. Tel. (613) 523-1770, ext. 201, or 1-800-267-6354.

August 17-20

CDA 1996 Convention in Montreal. Contact Laura Stephenson. Tel.: (613) 523-1770, ext. 246, or 1-800-267-6354, or fax (613) 523-3062.

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If you're not a CDA member, here's what you missed in the March/April issue of *Communiqué* ...

- **Dental Plans Remain Tax-Free**
- **Board Approves Launch of CDA's Public Education Program**
- **CDA Invited to Participate in National Forum On Health**
- **CDA To Meet With Health Minister**
- **RRSP Contribution Limits Frozen**
- **Report on the 1996 Federal Budget**

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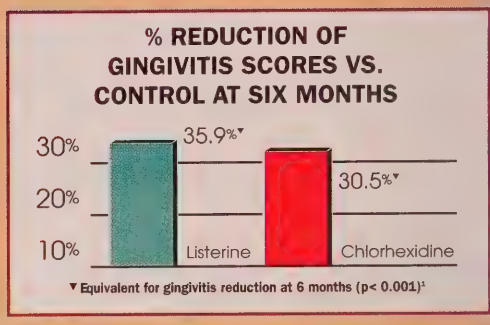

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1. Overholser CD et al. Comparative effects of two chemotherapeutic mouthrinses on the development of supragingival dental plaque and gingivitis. *J Clin Periodontol* 1990;17:575-579
2. Data on file, 1995.

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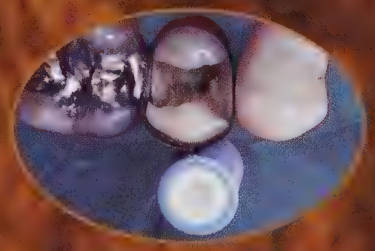

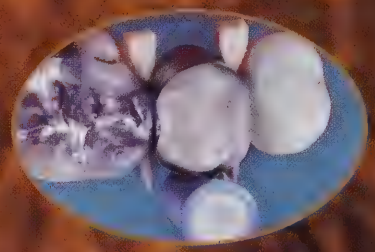

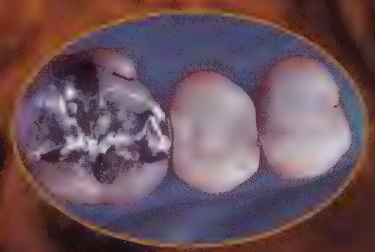

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Cover: Infection Control (Design by Denis Deslauriers; Images provided by A-Dec).

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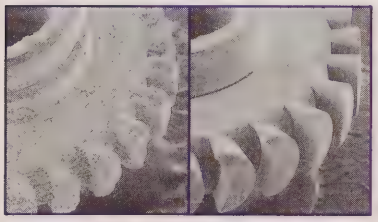

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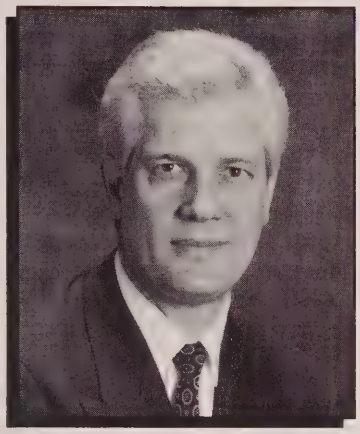


Dr. James R. Brookfield, CDA president.

When you read the CDA Task Force On Dental Education's preliminary report, you quickly come to the conclusion that both dentistry and dental education have reached a crossroads.

We clearly have some difficult decisions to make. If the report is correct, the status quo is untenable. Between government cutbacks and the weak Canadian economy, one or more of Canada's 10 dental faculties will almost certainly close if dental education maintains its present course.

But if we veer off in the direction taken by Alberta, and permit dental faculties at other universities to be integrated into a broader faculty of medicine and oral health sciences, we may be putting dentistry's status as a distinct and independent profession at risk. Dentistry could ultimately find itself in the position of playing second fiddle to medicine, both in terms of research allocations and facilities. Or it could become a specialty branch of medicine, along the lines of ear, nose and throat.

Neither time, nor circumstances, are on our side. North America is well on the way to becoming a caries-free society. Periodontal disease has ceased to be a major concern. And cuts in government funding have forced Canadian universities to consider previously unheard of options, including the elimination or forced merger of entire faculties.

These trends are already having an impact on dentistry. The decline in dental disease has contributed to an increased emphasis on practice management and cosmetic dentistry. We're already experiencing increased competition for patients in many parts of Canada, along with a proliferation of advertising. Many young dentists are finding it difficult to enter the profession in a rewarding way. And if managed care is allowed to gain a foothold in this country, dentistry's control over treatment planning and oral health care will almost certainly be diminished.

Dental education is also in a state of flux. Alberta recently integrated its dental school into a new faculty of medicine and oral health sciences. Toronto has doubled its dental school tuition fees. And Western has not only followed Toronto's lead in doubling tuition fees, it recently released a discussion paper outlining a number of other, even more drastic, options.

Titled *Looking Forward*, the discussion paper presents arguments in support of: closing Western's dental school outright; requiring the dental program to be self-funded (i.e. to be financed primarily through tuition fees, with little or no government support); or integrating the dental program into the faculty of medicine.

The real problem, which is clearly identified in Western's discussion paper, as well as in the Task Force's preliminary report, is money. Unlike medicine, which relies heavily on teaching hospitals to train new doctors, dental education involves extensive one-on-one teaching in the university clinic setting. This approach is effective, but it is not cheap. On a cost-per-student basis, dentistry is one of Western's most expensive programs to operate. And tuition fees aren't even coming close to paying these costs.

Although *Looking Forward* is only a discussion paper, Western has already stated that maintaining the status quo is not an option. At this point, integration with medicine seems to be the favored approach. *Looking Forward* indicates that it may be possible "to maintain an outstanding professional education program in dentistry" — at a "substantially reduced net cost" to Western — "by a combination of significantly increased tuition fees and the integration of the faculty of dentistry into the faculty of medicine." Under this scenario, "clinical dentistry education would be the responsibility of a new and important department in an integrated faculty of medicine."

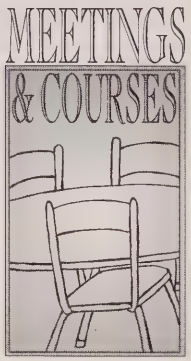
If the university moves toward a self-funded dental program, which it can apparently do under current government regulations, tuition fees will likely increase to $20,000 per year for undergraduate students by 1999-2000, and to as much as $25,000 per year for postgraduate orthodontics students.

Although closure is clearly not the preferred option, *Looking Forward* states that Western's dental students could easily be absorbed into the faculty of dentistry at the University of Toronto.

Clearly, dentistry must play a leading role in shaping the future of dental education in Canada. Our status as an independent, autonomous profession is at risk. Drastic changes in dental education should not be implemented on an ad hoc, university by university basis. We need to fully consider the consequences of any future changes, before they are implemented, and develop a strong, unified position that is in the best interests of our profession and the future oral health of our patients.

CDA's Task Force On Dental Education will present its final report to CDA's council on education in June 1997. As part of this process, it will survey CDA members across Canada on the dental education issue. I encourage you to participate.

James R. Brookfield, DDS
President of the Canadian Dental Association



INTERNATIONAL

July 11-13

International Women's Dental Conference in Melbourne, Australia. "Enhancing the balance both personally and professionally." Contact Amanda Lawrence, 3 Railway Walk, Hampton 31188, Australia. Tel.: (03) 9521 6500, or fax: (03) 9521 6501.

August 10-16

43rd World Congress of Young Dentists Worldwide (YDW) and International Association of Dental Students (IADS) in Göteborg, Sweden. Contact the IADS & YDW Congress Committee, Odontologen, Medicinaregatan 12 a, 8, 413 90 Göteborg, Sweden. Tel.: +46(0)31 773 32 08, or fax: +46(0)31 773 32 07.

August 19-23

21st North Queensland Dental Convention in Cairns, Australia. Contact Peter Martin, North Queensland Dental Convention, P.O. Box 388, Cairns 4870, Australia. Tel.: (070) 51 2351, or fax: (070) 31 2351.

August 21-24

2nd World Congress of Hungarian Dentists in Budapest, Hungary. Contact the Congress office of MATE, Ms. Zsuzsa Pintér, Budapest, P.O.B. 451, H-1372. Tel.: (36-1) 1329-571, or fax: (36-1) 1531-406.

September 4-8

18th Biennial Conference of the New Zealand Dental Association — Tomorrow's Dentistry Today in Rotorua, New Zealand. Contact the NZDA Conference Secretary, Dr. Roger Ayers, 19 Pukaki St., Rotorua, New Zealand. Tel.: +64 7 348 5385, or fax: +64 7 348 6788.

September 20-22

Australian Academy of Dentomaxillofacial Radiologists — 1996 Scientific Meeting in Gold Coast, Australia. Contact Dr. Ross Macdonald, 195 North Terrace, Adelaide, South Australia, 5000. Tel.: 61-8-(08) 223-2559, or fax: 61-8-(08) 223-2517. E-mail Internet: 100236.1444@CompuServe. COM

September 28 - October 1

FDI 1996 — 84th World Dental Congress in Orlando, Florida. Contact Laura Stephenson. Tel.: (613) 523-1770 ext. 246 or 1-800-267-6354.

October 5-8

International Conference on Stress and Health — ISMS 6 in Sydney, Australia. Contact F.J. McGuigan, Institute for Stress Management, 10455 Pomerado Rd., San Diego, Calif. 92131. Tel.: (619) 635-4698, or fax: (619) 635-4669. Internet: NOSTRESS@sanac.USIU.edu.

November 27-30

5th Pakistan International & 18th National Dental Conference in Karachi, Pakistan. Contact the College of Dental Surgery, Liaquat Medical College, Jamshoro, Hyderabad, Sindh, Pakistan.

CANADA

July 6

HIV Prevention Works — a satellite symposium of the XI International Conference on AIDS in Vancouver, B.C. Contact the Canadian Public Health Association, 400-1565 Carling Ave., Ottawa, Ont. K1Z 8R1. Tel.: (613) 725-3769, or fax: (613) 725-9826.

July 23-26

8th International Congress of the International Association of Oral Pathologists in Toronto. Contact the Congress Office, P.O. Box 1570, 190 Railway St., Kingston, Ont. K6L 5C8.

August 16-17

6th Annual Meeting — Atlantic Provinces AGD, Digby Pines resort, Nova Scotia. Contact Dr. Alex Fischel (902) 825-4837, or Dr. Jack Thompson (506) 847-4243.

August 17-20

Canadian Dental Association 1996 Convention in Montreal. Scientific sessions, exhibit hall, social events, special activities, spouse's program and children's program. Contact Laura Stephenson. Tel.: (613) 523-1770, ext. 246, 1-800-267-6354, or fax: (613) 523-3062.

August 17-20

Annual Convocation and Meeting of the Canadian Section of the International College of Dentists in Montreal, Que. Contact the Canadian Section of ICD, 12A Yonge Blvd., Suite 1, Toronto, Ont. M5M 3G5.

August 17-22

8th World Congress on Pain in Vancouver, B.C. Sponsored by the International Association for the Study for Pain (IASP). Contact the IASP Secretariat, 909 N.E. 43rd St., Suite 306, Seattle, Wash. 98105, U.S.A. Tel.: (206) 547-6409, or fax: (206) 547-1703.

September 7-8

Royal College of Dentists of Canada Convocation, Annual Dinner and Annual Meeting in Montreal, Que. Contact Kay Montgomery, tel.: (416) 929-2722, or fax: (416) 929-5924.

October 2-6

32nd Annual Meeting of the Canadian Academy of Endodontics in Kelowna, B.C. Contact Dr. W.J. Froese, tel.: (604) 763-0855, or fax: (604) 763-1124.

October 3-5

Canadian Association of Orthodontists Annual Scientific Session, in Toronto, Ont. Contact Diane Gaunt. Tel. (416) 491-3186, or fax: (416) 491-1670.

October 25-26

Thompson Okanagan Dental Society Annual Meeting and Convention in Kelowna, British Columbia. Contact: Lane Shupe, tel./fax: (604) 764-2247.

November 1-2

Southern Ontario Surgical Orthodontic Study Group will meet in Windsor. Contact Dr. Jeff Berger. Tel: (519) 258-2632, or fax: (519) 258-2637.

U.S.A.

July 25-27

10th National Conference on the Young Dentist — A Decade of Excellence, in Cleveland, Ohio. Contact the American Dental Association Committee on the New Dentist. Tel.: (312) 440-2779.

September 5-6

Second Annual Conference on Geriatric Oral Health — Dentistry and Drugs in the Elderly — in Ann Arbor, Michigan. Contact the University of Michigan's office of continuing dental education. Tel.: (313) 763-5070.

September 25-27

Call for abstracts for the **59th Annual Meeting of the American Association of Public Health Dentistry** in Orlando, Florida. Deadline for submission is May 1, 1996. Contact the AAPHD National Office, 10619 Jousting Lane, Richmond, Va. 23235-8344. Tel.: (804) 272-8344, or fax: (804) 272-0802.

November 4-5

American Board of Oral and Maxillofacial Radiology — 1996 Certifying Examination in San Diego, California. Applications must be received by May 3, 1996. Contact Dr. R. Curtis Lundeen, Oral Radiology, Oregon Health Sciences University, School of Dentistry, 611 S.W. Campus Dr., Portland, Ore. 97201-3097. Tel.: (503) 494-8930.

DENTAL MEETINGS

August 17-20

Annual Meeting of the CDA Board of Governors, in Montreal. Contact Suzanne Burton. Tel. (613) 523-1770, ext. 201, or 1-800-267-6354.

August 17-20

CDA 1996 Convention in Montreal. Contact Laura Stephenson. Tel.: (613) 523-1770, ext. 246, or 1-800-267-6354, or fax (613) 523-3062.

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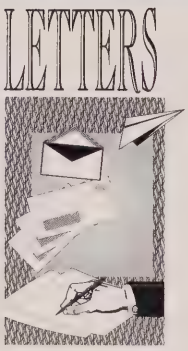

Flossy Riders Motorcycle Rally

The members of the flossy riders motorcycle rally committee extend a heartfelt thanks to the *CDA Journal* for helping us reach a Canada-wide audience of dental professionals interested in attending our first annual motorcycle rally.

Mainly through the News Update story published in the February 1996 issue of the *Journal* (Calling All Motorcycle Enthusiasts. 62(2):132, 1996), we now have enough motorcycle enthusiasts to hold the first annual Flossy Riders Motorcycle Rally, August 2-6, 1996, at the Timberland Campground just outside of Renfrew, Ontario, in the heart of the Ottawa valley.

Information and registration forms are available by phoning (613) 224-7856 (evenings).

Christie Hatt, chairperson
Ottawa, Ontario

La denturologie

En février dernier, le *Journal de l'Association dentaire canadienne* publiait un éditorial spécial sur la denturologie. Comme il fallait s'y attendre, les propos du Dr Rubinoff ont choqué plusieurs denturologistes, au point que M. Austin Carbone, président de l'Association canadienne des denturologistes, a jugé utile d'y répondre par écrit (voir *J Can Dent Assoc* 62(5):376, 1996). Dans cette lettre, M. Carbone écrit que les denturologiste canadiens sont des «spécialistes du dentier» et que leur formation en prothèse amovible est meilleure que celle des dentistes généralistes. Avec ces deux affirmations, nous touchons à l'essence du conflit: les dentistes prétendent que les denturologistes n'ont pas la formation pour exécuter toutes les tâches qu'ils réclament alors que les denturologistes pensent qu'ils sont plus qualifiés que les dentistes pour accomplir ces actes.

D'après le Larousse, le mot spécialiste s'applique à quelqu'un qui s'occupe exclusivement d'une science, d'un art. D'après cette définition, les denturologistes pourraient se prétendre des spécialistes. Par contre, ce dictionnaire illustre cette définition de la façon suivante: «Médecin qui étudie un genre de maladie ou les maladies d'un système, d'un organe en particulier.» Cet exemple introduit une dimension supplémentaire: un spécialiste est quelqu'un qui a acquis une connaissance générale d'une science avant de poursuivre des études dans un domaine particulier de celle-ci. Tout comme les dentistes formés en Amérique du Nord ne peuvent prétendre au titre de médecin spécialiste parce qu'ils n'ont jamais acquis les connaissances d'un médecin généraliste, les denturologistes canadiens ne sont pas des spécialistes de la prothèse amovible parce qu'ils n'ont pas une formation générale adéquate en médecine dentaire.

Comme prosthodontiste, j'apprécie le rôle primordial que joue mon technicien dentaire dans la confection des restaurations de mes patients. Sans avoir à comparer le nombre d'heures que nous avons respectivement passées à apprendre les étapes techniques de leurs fabrications, il est évident qu'il est beaucoup plus qualifié que moi pour fabriquer des couronnes et des ponts à partir des modèles que je lui soumets. J'ose cependant espérer que personne ne prétendra que sa formation le rend plus apte que moi à traiter des patients. De la même façon, je suis convaincu qu'au cours de ses 2000 heures de formation, le denturologiste acquièrt certaines connaissances et des habilitées techniques supérieures à celles d'un dentiste généraliste. Il n'en reste pas moins que la formation en sciences de base et dans toutes les facettes de la dentisterie font que le dentiste est plus qualifié pour assurer la restauration ou le maintien de la santé buccale des patients.

Dans sa lettre, M. Carbone cite le Danemark en exemple parce que les dentistes et denturologistes font les deux premières années de leurs études ensemble et que plusieurs diplômés de l'Université d'Aarhus détiennent des diplômes en médecine dentaire et en denturologie. Loin de me sembler souhaitable, cette situation sépare artificiellement la médecine dentaire en deux. Au Canada, la denturologie n'est pas apparue en réponse à une lacune dans la qualité des soins de prothèse amovible offerts par les dentistes, mais plutôt pour offrir une alternative bon marché aux patients. Pour que le public s'y retrouve, il est primordial de garder une distinction nette entre les deux professions, que les denturologistes continuent à rendre les services qui justifient leur existence et qu'ils cessent de tenter de devenir des dentistes sans passer par l'université.

Un maçon peut très bien construire un mur de brique, mais il faut un architecte pour bâtir une maison.

Benoît Soucy, DMD, M.Sc.
Président élu, L'Association des prosthodontistes du Canada

Infection Control Procedures — Who Should Decide What Cannot Be Used?

Rella P. Christensen, PhD

It's time for clinicians to consider the implications of the illogical scenario that was presented recently when an immunocompromised patient — infected with a virus considered 100 per cent fatal — accused a dentist of discrimination for using additional infection control measures.

When a clinician decides to use infection control procedures beyond the standards set by law, the issues are the clinician's professional judgment and personal rights — and these are outside the jurisdiction of the patient and the courts.

The issues involving HIV infection extend beyond the rights of infected people versus the rights of health-care personnel, and force us to ask some serious questions: 1) Do rights become special privileges if they are not enjoyed equally by the infected patient and the clinician? 2) In the management of a worldwide epidemic, should clinicians be exposed to possible infection to avoid embarrassing the infected patient? 3) Should government officials and judges be given the authority to punish clincians for using "extra" infection control procedures when their frame of reference may not include prolonged personal contact with an infected person's blood, mucous, saliva, pus, or other potentially infectious materials?

Who decided that HIV infection was a human rights issue, when all other viral infections are medical issues, where containment of transmission takes precedence over everybody's "rights"?

Has it been forgotten that HIV-infected people host other organisms universally recognized as infectious, such as tuberculosis, hepatitis B, herpes, cytomegalovirus, and cyphilis?

Current policies linking HIV infection to the personal rights of the infected person are dangerous to dental clinicians for three reasons:

1. The possibility that infection may be transmitted to the dental clinician is denied when only the possibility of embarrassing the HIV-infected patient is considered.
2. Basic, logical and effective infection control practices — such as the identification and isolation of infected individuals and the subsequent use of additional precautions — are ignored when only the possibility of embarrassing the HIV-infected patient is considered.
3. Legal precedents are being set that could later be applied to all infectious diseases, where only the rights of the infected person are considered.

Two official stances of the U.S. Centers for Disease Control and Prevention (CDC) have allowed the current litigious aggression of HIV-infected people in dental clinics:

1. "Risk of transmitting viruses like HIV in the health-care setting is minimal."[1]

What does "minimal" mean? Even CDC's most conservative estimates, omitting all possible pre-disposing factors, admit to 143 cases of HIV transmission from patients to health-care workers — of whom six have been identified as dental clinicians.

When considering these numbers, it is important to note that the majority of infected people have not yet progressed to AIDS, since this disease generally has a 10- to 15-year incubation period. It is also important to note that characteristics of viruses, such as infectivity, can change quickly — in either direction. Therefore, it is impossible for CDC to assess actual risk of HIV transmission. At best, CDC can issue a statistically computed guess — which, unfortunately, doesn't matter to the six dental clinicians who have already been infected.

However, others see the risk of AIDS transmission to health-care workers differently. Dr. David D. Ho, director of the Aaron Diamond AIDS Research Center in New York City, and author of numerous landmark AIDS discoveries, has reported methods for quantifying viable HIV in live humans in various stages of the disease (**Table I**).[2]

Table I clearly shows viable viruses present in the blood of HIV-infected people in all stages of HIV infection, whether or not the patient displays symptoms. The potential for transmission, therefore, is always present, and escalates dramatically when symptoms appear.

Figures 1 and **2** show the very small amounts of blood referenced in some of the categories of **Table I**. Clinically, amounts of blood similar to these can be involved in stick and scratch injuries from used explorers, scalers, scalpel blades, needles, etc. The ever-escalating incidence of HIV infection among intravenous drug users demonstrates repeatedly how easily HIV is transferred by small quantities of blood. Yet CDC and HIV-infected people continue to subject dental clinicians to HIV Russian roulette, gambling that most HIV cases will be treated without transmission. And, incredibly, if a clinical accident does occur, the laws in many locations prevent HIV testing of the patient involved without his or her consent.

The risk of HIV transmission in dental clinics is unknown, and what is "known" could change quickly and radically, as the virus mutates.

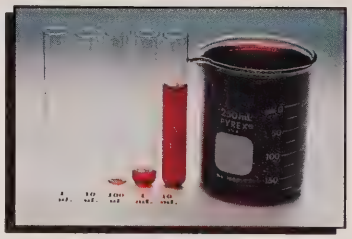

Fig. 1: Visual demonstration of the fluid volumes referred to in ***Table I.***

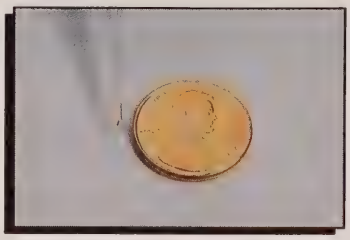

Fig. 2: Fluid volume contained in one microliter (µL) related to the size of a penny. Note that a microliter of red fluid is so small it is invisible in the test tube in ***Fig. 1.***

2. "Universal precautions prevent the spread of almost all bloodborne diseases, including HIV."[1]

Where are the data to confirm this statement? The concept of "universal precautions" presupposes that infection control products actually block or kill most microorganisms. Yet neither CDC nor any government agency actually tests the efficacy of the masks, gloves, disinfectants, barriers, etc., on which the concept of universal precautions depends.

For more than 20 years, Clinical Research Associates has been publishing extensive reports documenting the failure of most infection control products to meet their claims. We have reported masks that fail to filter adequately,[3-5] operating gloves that leak,[6-12] and disinfectants that fail to kill even as labelled, let alone in the presence of human whole blood or other clinically relevant bioburden.[13-23] Data like these invalidate the concept of universal precautions — when the products fail, the concept fails.

Another problem with the concept of universal precautions is that third-party payment often fails to cover the higher cost of truly efficacious products.

Most infection control products fail to do what they are supposed to do. This not only invalidates CDC's universal precautions concept, it poses a particular danger because both the patient and the clinician think they are protected when they are not.

It is a clinician's personal right to choose the infection control procedures he or she desires to use beyond those required by law. The choice belongs to the clinician only because there is no possible way for anyone else to predict such things as individual procedure complications, immune competency of the clinician at the time of treatment, hostile conduct of infected patients who may attempt to purposely transmit organisms, and the unknown efficacy of infection control products that government agencies certify without testing.

In the legal cases, we read that HIV-infected people experience "emotional anguish" that is quenchable only by five- and six-digit settlements, solely because extra infection control procedures were used during their treatment. This "anguish" apparently extends for many months after treatment, thus allowing for the initiation of legal suits long after the treatment has been completed.

In my opinion, clinicians suffer mental anguish many times greater than that of their infected patients because they worry their way through treatments that involve hours of hands-on contact with infected body fluids. When infection is known, or suspected, extra precautions are not only warranted, they are mandatory due to the increased tension that clinicians experience when treating infectious persons, which can result in accidents.

The potential for transmission of infection to a dental clinician is always present during the treatment of an HIV-infected patient. HIV-infected patients have the right to treatment, but they do not have the right to dictate which infection control procedures cannot be used during their treatment. Furthermore, this right does not belong to any government, or agency, or court. If a clinician desires to practise infection control beyond the standards set forth by law, this is a professional judgment and a personal right. ■

During 20 years of extensive research on hundreds of infection control products, CRA has compiled a list of products that met objectives for use at the time of testing.

To obtain this list, write, or fax: Infection Control Products List; Clinical Research Associates, 3707 North Canyon Road, Suite 6, Provo, UT 84604, U.S.A.; Fax: 801-226-4726.

Dr. Rella Christensen is the director of Clinical Research Associates in Provo, Utah.

Table I

Calculation of levels of HIV-1 potentially transmitted from blood of HIV-1-positive patients

	Tissue-culture-infective doses (TCID) of HIV-1	
	From asymptomatic HIV-1-positive patients	From patients with ARC or AIDS
250-mL unit of blood for transfusion	15,000	1,750,000
1 to 10 mL of blood for laboratory evaluation	60 for 1 mL 600 for 10 mL	7,000 for 1 mL 70,000 for 10 mL
10 to 100 µL of blood on needles shared by intravenous drug users	0.6 for 10 µL 6 for 100 µL	70 for 10 µL 700 for 100 µL
1 µL of blood in needlestick injuries	0.06	7

Figures are based on the calculation (derived from study data[24]) that whole blood of asymptomatic patients harbors approximately 60 TCID/mL and that blood from ARC or AIDS patients carries 7,000 TCID/mL.

ARC, AIDS-related complex; AIDS, acquired immunodeficiency syndrome.

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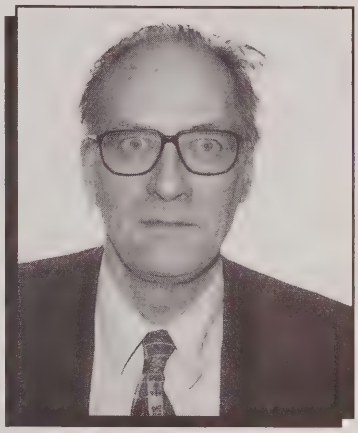
GUEST EDITORIAL

THE LAW AND ETHICS REGARDING INFECTION CONTROL IN TREATING HIV-POSITIVE PATIENTS



Peter E. Graham, BA, BCL, QC

Mili Harel-Raviv, DMD, Dip. Oral Med.

A News Update story published in the April 1996 issue of the *CDA Journal*, "Ottawa Dentist Cleared in HIV Discrimination Case," is worthy of comment.

The story deals with the case of an Ontario female dentist who wore an extra disposable gown over her regular clinical clothing during a two-hour appointment to provide restorative treatment to an HIV-positive patient.

As noted in the story, the patient's subsequent complaint to the Ontario Human Rights Commission (OHRC) was dismissed in first instance and on appeal. Shortly before the OHRC appeal judgment was rendered, however, the dentist, under a provision of the Ontario Regulated Health Professions Act, was summoned by a panel of the complaints committee of the Royal College of Dental Surgeons of Ontario (RCDS) to receive a caution.

When she appeared before the RCDS panel January 26, the dentist was advised that it is generally wrong to treat people who realize and admit that they are HIV-seropositive differently from other patients, and that any special treatment must be justified and appropriate.

It is correct that two different tribunals or administrative bodies can render different decisions. The RCDS is not bound by the decisions of the OHRC. However, with all due respect, in our opinion, the RCDS was wrong.

As we understand the human rights legislation concerning illegal discrimination against people who seek services, there can only be illegal discrimination in the furnishing of services. In dentistry, this would mean interviewing, examining the patient and performing the necessary treatment. In our opinion, it is neither illegal nor unethical for dentists — or any other health care providers — to protect themselves by using the best infection control methods available, so long as this does not interfere with the quality of the treatment they provide. Using extra barrier precautions does not constitute a failure to provide health services in a reasonable manner.

In our view, actions such as wearing an extra disposable gown during the treatment of patients who have particular infectious diseases are neither illegal nor ethically improper. The OHRC had sufficiently clear vision to see this in the Ottawa case. We believe its decision was correct.

In regards to dental ethics (which is the domain of the provincial licensing authorities), regulations in each province require dentists to use integrity at all times in their professional activities, and to respect all patients. In our opinion, however, the integrity of the health service provider is not diminished, nor is any lack of respect shown to patients, by dentists protecting themselves from possible harm when they provide treatment to potentially infectious patients.

Principles should not be taken out of context or distorted in such a way that they are applied beyond their intended purpose. This is what the RCDS appears to have done by cautioning a dentist that she acted in an improper manner when she clearly used appropriate infection control procedures beyond the guidelines of the RCDS.

The licensing authority of a profession should not attempt to restrict practitioners from taking such precautions as they may subjectively deem appropriate to protect themselves, their staff, and their operatory from contamination by any infectious diseases during a treatment session. No one knows all there is to know about the HIV virus. This is made only too clear by the level of precautions being taken by the scientists investigating the HIV virus. Despite all we claim to know about HIV, and the sophistication of today's laboratories, which are designed to be as safe as possible with optimum infection control, these researchers still perceive a need to take additional measures.

This is not to say that dentists should ignore the stress that HIV-positive patients may feel, or their desire not to be the object of any undue attention. However, we believe that it is appropriate for dentists who know that their next patient is HIV positive to act in a very discrete manner, while doing what is necessary to achieve the best possible infection control, before the patient enters the operatory and sits in the dental chair. This approach will reduce the patient's stress, as his or her attention will not be drawn to any extra precautions being taken. In fact, the patient may not be aware of what precautions have or have not been taken with other patients. ■

Peter E. Graham is an assistant professor of preventive and community dentistry, faculty of dentistry, McGill University, and a partner in McDougall, Caron, a Montreal law firm.

Dr. Mili Harel-Raviv is assistant professor and head of the department of preventive and community dentistry, and is responsible for law and ethics courses, faculty of dentistry, McGill University.

SELF-LEARNING SELF-ASSESSMENT

Since last September, the SLSA Program has been published as a monthly feature in the *Journal of the Canadian Dental Association* as a resource for dentists wishing to enhance their knowledge and expertise. It is intended as a vehicle for self-learning and self-assessment. The program is based on a series of 40 questions, answers, rationales and references, followed by a quiz of 15 questions. Included with this issue, you will find the Quiz for the 1995-96 SLSA Program, together with a response card.

All 10 provincial licensing authorities in Canada recognize the SLSA Program for continuing education credits. In order to receive these credits, dentists must complete and return the enclosed response card to the Canadian Dental Association by August 10, 1996. The names of those dentists who return the completed quiz response cards will be forwarded to their respective licensing authorities for consideration.

Answers to the Quiz will be published in the August 1996 issue of the *Journal*. Quiz results will not be provided by either CDA or SLSA.

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NEWS UPDATE

Niagara College Restructures Dental Assisting and Hygiene Programs

Niagara College has restructured its dental assisting and dental hygiene programs to provide two separate, direct entry post-secondary programs.

"These exciting post-secondary programs will prepare graduates to meet the challenges of the 21st century," said Mr. Robert Baddeley, the college's director of allied health studies, in a brochure promoting the programs. "Dentistry will increasingly require clinicians with advanced knowledge and clinical skills... Niagara College has restructured its dental programs with these new realities in mind. Both programs feature new and exciting courses to develop career opportunities to their fullest and will include studies in entrepreneurship, dental marketplace, multiculturalism, gerodontology and research."

Scheduled to open in August 1996, the intraoral dental assisting course is designed to educate students at the national Level II dental assisting scope of practice level. Graduates of the one-year, full-time program will have a wide range of skills, including: coronal polishing, fluoride application, application and removal of rubber dams, taking impressions, oral hygiene instruction, taking and processing radiographs, application and removal of matrices and wedges, and application of cavity liners and varnishes.

The two-year, full-time dental hygiene program will teach students how to use scientific methods "for the control and prevention of oral diseases," and to "aid individuals and groups in attaining and maintaining optimal oral health.

Tuition for both courses is $8,890 per year. Niagara College is located in Welland, Ontario. ■

Ottawa-Carleton Liver Foundation Holds a Celebration of Life

The Ottawa-Carleton chapter of the Canadian Liver Foundation held its seventh annual Celebration of Life Service April 21 in appreciation of organ donors and their families.

"All organ donors and their families must be thanked for improving the quality of our lives and, in many cases, giving us life," said Pamela Johnson, a 1988 liver transplant recipient, and one of the principal organizers of the special service, held at Christ Church Cathedral in Ottawa, Ontario.

"Theirs is the most selfless act imaginable," said Ms. Johnson. "Their generosity can only be partially repaid by our Celebration of Life Service."

Dr. Denis Wells, the Ottawa endodontist who received a heart transplant in August 1990, was one of the eight organ recipients who spoke at the service, which was at-

National Dental Associations Discuss Family Violence Issues

Representatives from Health Canada and five national dental associations met at CDA headquarters in Ottawa March 13 to discuss the dental community's response to family violence.

The meeting was part of a unique Family Violence Initiative that Health Canada launched last year to enhance the dental community's awareness of the issue, and encourage them to show greater sensitivity when they treat patients affected by family violence.

Much of the meeting was focused on the steps that health care associations, like CDA, can take to bring the message of family violence to their members. Consultants Joan Gillespie and Donna Denham also reported on the success of recent skill development workshops held in Edmonton, Vancouver and Toronto.

Meeting participants reviewed a selection of Health Canada's family violence resource materials, including the recent publication, *Family Violence Handbook for the Dental Community*. The 50-page booklet deals with all aspects of family violence, from recognition to subsequent action.

A full range of family violence resource material is available from Health Canada's national clearinghouse on family violence; (613) 957-2938, or 1 (800) 267-1291. ■

National dental associations discuss family violence issues (l. to r.): Seated, chairperson, Joan Simpson, Health Canada; consultants Donna Denham and Joan Gillespie; Sharon Amer, health care and issues division, Health Canada; Barbara Merriam, national clearinghouse on family violence, Health Canada. Back row, Carole Worobey, Canadian Dental Hygienists Association; Ralph Crawford, CDA; Jill Ramsey, Canadian Dental Assistants Association; Carl Lakaski, mental health unit, Health Canada; Debi Ball, Canadian Dental Therapists Association; Maureen Connors, First Nations and Inuit Health Programs; Sandra Davis, director, corporate services, CDA; Susan Matheson, manager, education, CDA; Janice Edgar, Canadian Dental Hygienists Association; Randy Williamson, Canadian Dental Therapists Association; Martha Vaughan, manager library and information services, CDA.

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Dr. Denis and Mrs. Doreen Wells at the Ottawa-Carleton Celebration Of Life Service.

tended by family members and friends of organ donors. The speakers also included three Ottawa physicians associated with the donor program.

Held annually in celebration of Organ Donor Awareness Week, the 1996 service was dedicated to the memory of Brian D. Smith, the Ottawa sportscaster and former National Hockey League player who was shot and killed August 1, 1995.

The dedication had special meaning for Dr. Wells. Brian Smith was both his friend and his patient. Their relationship, which began before Dr. Wells suffered congestive heart failure in January 1989, continued unabated during his successful transplant surgery in August 1990, and the seven-months he needed to reach a full recovery. In fact, Brian Smith's interest in Dr. Well's successful transplant story inspired his family to donate 12 of the sportscaster's organs after his tragic death.

In his address, which he delivered wearing a tie covered with red hearts, Dr. Wells emphasized that the true heros are the transplant families.

"Approximately half the people on the waiting list for a heart die," said Dr. Wells. "People have good intentions, but they have to learn to turn them into action by signing a donor card, and telling their family of their wishes to donate their organs. Lives could be saved."

Today, Dr. Wells leads a full and active life, and maintains a specialty dental practice. ■

WHAT'S IT

The April "What's It?," sent to us by Dr. Jack Harris of Komoka, Ontario, (Jack knew what it was all the time!) was no real mystery to a number of our readers. Thanks to Drs. Robert Faith of Montreal, Edward J. Abrahams of Ottawa, C. Bruce Morrow of Hamilton, A.P. Kozier of Vancouver, and Ms. Lynne Cousins, of Ivoclar, in St. Catharines, Ontario, who identified the instrument as a lingual bar bender.

Manufactured by Williams Gold, the instrument was apparently quite common in the 1950s, and was used to shape gold and stainless steel lingual arches for partial denture construction. Do you have any old instruments or dental materials that you can't name, or can't identify a use for. Send them to the *Journal's* "What's It?" column, care of Dr. Ralph Crawford, Editor, CDA, 1815 Alta Vista Drive, Ottawa, ON K1G 3Y6. There is bound to be some reader out there with a sharp eye and memory. ■

APPOINTMENT

Ontario Orthodontists Elect Officers

Dr. Gordon Organ of Mississauga has been elected president of the Ontario Association of Orthodontists for the 1996-97 term.

Serving with Dr. Organ on the executive board are vice-president, Dr. Michael Taylor, Hamilton; secretary-treasurer, Dr. Gerry Solomon, Toronto; and immediate past-president, Dr. Hugh Fraser, Brampton. ■

LIBRARY PACKAGE

The Library Package for June is **SINGLE TOOTH IMPLANTS.** This package of current information is available to CDA members for $5.00 plus applicable tax.

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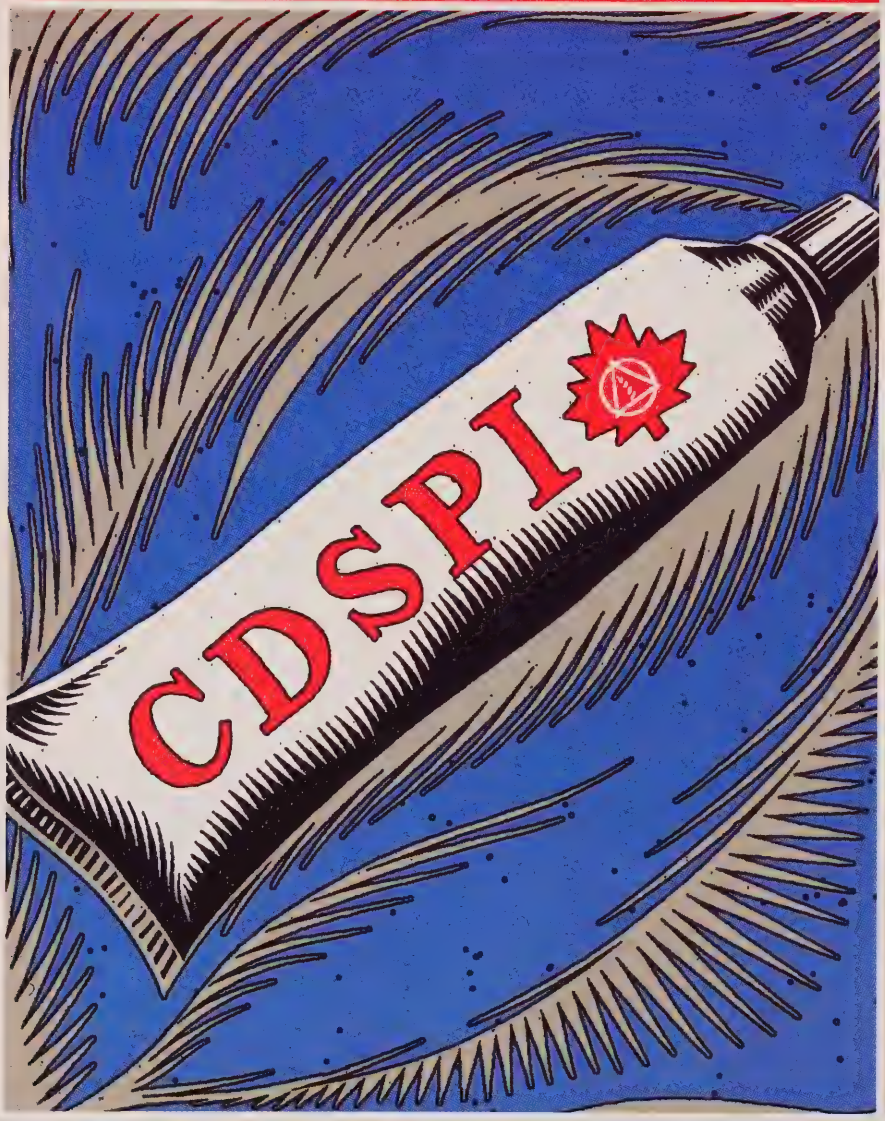

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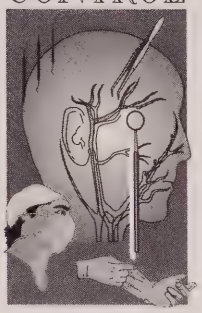

Continuing Investigation and Controversy Regarding Risk Of Transmission Of Infection Via Dental Handpieces

J.B. Epstein, DMD, MSD
G. Rea, B.Sc., DMD
C.H. Sherlock, MB, FRCP(C)
R.G. Mathias, MD, FRCP(C)

ABSTRACT

Current epidemiologic evidence indicates that infectious diseases, specifically blood-borne pathogens such as hepatitis B, hepatitis C and HIV, are not transmitted from patient to patient via dental instruments. However, ongoing laboratory investigations suggest that potential pathogens may be retained within dental handpieces, creating a theoretical risk of cross infection. Controversy regarding certain laboratory study results and the clinical implications of these studies continues. Guidelines and regulations for infection control should be rational, and based on a realistic response to a documented risk. Dental professionals should be aware of continuing research focusing on these issues.

SOMMAIRE

D'après les preuves épidémiologiques actuelles, les maladies infectieuses, en particulier les maladies à diffusion hématogène comme l'hépatite B, l'hépatite C et le HIV, ne se transmettent pas d'un patient à un autre par des instruments dentaires. Cependant, des recherches faites présentement en laboratoire suggèrent que les pièces à main peuvent retenir des agents pathogènes, créant en principe un risque de contamination croisée. Aussi la controverse se poursuit-elle touchant les résultats de certaines études faites en laboratoire et touchant leurs conséquences sur le plan clinique. Les directives et les règlements visant à réduire les risques d'infection doivent procéder de la raison et s'appuyer sur une réponse réaliste aux risques documentés. Les professionnels dentaires doivent être au courant des recherches qui se poursuivent pour résoudre ces problèmes.

Introduction

Current epidemiologic evidence suggests that patient to patient transmission of infectious diseases, including hepatitis B (HBV), hepatitis C (HCV) and human immunodeficiency virus (HIV), does not occur via dental instrumentation.[1-5] However, the potential transmission of disease by contaminated rotary dental instruments has received continuing attention from investigators.[4,7-12] While many of the models in these *in-vitro* studies bear little relevance to clinical practice, and do not involve an assessment of transmittable organisms, they do demonstrate that fluids and organisms may be retracted into rotary dental instruments under certain conditions.

In conjunction with a review of the available literature, this paper discusses the continuing controversy surrounding the potential contamination of the dental handpiece. Its intent is to update the dental provider and facilitate informed decision making regarding this issue.

Literature Review

Several of the laboratory-based models used to assess the risk of contamination of dental handpieces have been based on their uptake of dye-colored water.[4,7-9] However, the retraction of colored water into a dental handpiece does not represent the clinical situation, the viscosity of the oral fluids, nor any of the factors related to known potential pathogens. It therefore bears no known relation to the transmission of disease. At the same time, these studies demonstrate the potential for oral fluids to be retracted into dental instruments, which suggests the need for more clinically relevant research.

Other studies have demonstrated the possible retention of organisms on or in dental handpieces.[4,6,9] In a study by Lewis and Boe, a laboratory model of a non-human pathogen, a bacteriophage, was found to be viable following its retraction into a dental handpiece.[6] In another laboratory study involving dental handpieces, Lewis and Boe did not detect the presence of bacteria after surface disinfection.[4]

Despite the lack of adequate controls in their laboratory results, and the fact that they failed to address the potential risk from human viral pathogens, or to simulate clinical conditions, Lewis and Boe postulated that HIV infection could be transmitted via dental handpieces.[4] This was unfortunate, as the discussion and conclusion of any study must be based on the actual results presented.

Lewis et al[6] also detected the presence of HIV and HBV DNA (not whole infectious virus) in dental handpieces subsequent to their clinical use. However, they identified HIV DNA in a surprisingly large number of the few patients they studied. The high number of positive handpieces detected was also unusual, based on the infrequent presence of HIV in the general population and the low number of similar

positive results identified in other studies assessing the presence of HIV in the oral environment.[13]

HBV was detected by identifying the presence of HBV-DNA. In reality, the viability of the virus cannot be assessed without the use of animal models to study the incidence of infection by the human pathogen.[6] The presence of DNA does not equate with infection, but it does indicate the possibility of infection.

Mills, Kuehne, and Bradley also used the dye retraction model to assess handpiece contamination, and found that colored water may be retracted into the turbine of the handpiece. They then evaluated 20 handpieces, following clinical use, but could not demonstrate the presence of viable bacteria.[9]

We developed a laboratory model using herpes simplex virus (HSV). HSV was selected because it is a human pathogen, it is found in oral secretions, and laboratory methods have been established to detect and quantify viable infectious virus.[11,14,15] In addition, HSV may be present in the patient's oral secretions even in the absence of oral lesions (viral shedding), although it may be present in higher concentration in patients with herpetic lesions. HSV infection is an occupational risk for dental workers, and HSV has been transmitted to patients during dental treatment.[16-22] HSV is a medium-sized lipid-enveloped virus, and is classified in the same category as HIV in the Spaulding system of microbial resistance to germicidal agents.[23]

Although our studies were conducted in the laboratory, we attempted to simulate clinical conditions. This involved immersing the handpieces in infected transport medium, with intermittent running and stopping of the instrument for several cycles. Transport medium closely resembles saliva in viscosity, because of its serum content.

Each instrument was then run in a viral collection medium, and viable virus was assessed in cell culture. In a follow-up study,[11] we assessed the addition of anti-retraction valves to the dental unit, which has been recommended[24] as a means of reducing or eliminating internal contamination. Glutaraldehyde disinfectant was used to wipe-down the external surfaces of the handpieces, followed by a final wipe-down using alcohol. Each instrument was then disconnected from the dental unit. A modified coupling was placed on the ports of the handpiece, sterile saline or disinfectant was run through the lines of the instrument, and specimens were collected for culture.

External surface disinfection was insufficient to prevent viral recovery from 60 per cent of the instruments. No virus was recovered from 20 per cent, and recovery occurred in one instrument at low dilution only.

Similar results were obtained for the handpieces treated with surface disinfection and internal saline flushing. Virus was retained in the internal portions of all handpieces, although the amount of virus recovered was reduced. When contaminated instruments were treated with surface disinfection and internal chemical disinfection, no virus was recovered.[11,14]

Although the addition of anti-retraction valves to the dental unit has resulted in a 4,000-fold decrease in the bacterial contamination of dental handpiece water lines,[25] our HSV study demonstrated no significant difference in virus recovery with or without anti-retraction valves.[14,26]

The results obtained through our laboratory models indicate that there is potential for rotary instruments to be contaminated in the dental setting. However, the site of viral retention, whether it is the turbine, or the air or water lines of the instrument or unit, is not known.

In a recent report, Lewis and Arens continued their examination of the potential for bacteria to survive disinfectant procedures.[10] Their *in-vitro* laboratory work included a series of studies using HIV in whole blood and a bacterium, *Pseudomonas aeruginosa,* in blood and plasma.[10] Contaminated blood and plasma were placed in petroleum-based lubricant, similar to that used in dental handpieces, and in a water-soluble lubricant used for endoscope lubrication. It was reported that the contaminated petroleum-based lubricant remained infectious after submersion in two per cent glutaraldehye for two hours. These authors also assessed the amount of blood-contaminated saliva retained in slow-speed prophylaxis angles, and compared it to the amount of fluid that may be present in a simulated needle stick, where the risk of transmission of HIV has been estimated at 0.3 per cent of sharps exposures. They found that 1.7 ± 0.4 µL of blood-contaminated saliva was present in the prophylaxis angles, and that sealed angles retained 0.020 ± 0.008 µL, compared with needle fluid volumes of 0.10 ± 0.02 µL. Lewis and Arens suggest that the amount of blood that could be transferred through contaminated angles is sufficient to infect human lymphocyte cultures with HIV in their laboratory model. However, the blood in a syringe must be injected percutaneously, and even then, this volume of blood leads to sevoconversion (transmission of infection) in only approximately 0.3 per cent of exposures.

Lewis and Arens extrapolate their laboratory findings to suggest that dental lubricants increase the resistance of organisms to disinfection, and therefore increase the risk of disease transmission in the dental office. Although they suggest that glutaraldehyde treatment will reduce the risk of viral transfer, this was not assessed in a clinical model. They conclude that reusable dental devices should be subjected to heat sterilization that penetrates the lubricant.

Current laboratory studies do not address the presence of saliva in the clinical situation, the diluting effect of saliva and water, the rare presence of visible blood during dental prophylaxis, the presence of anti-viral factors in saliva, and the lack of epidemiologic evidence to suggest the transmission of infection via dental instrumentation, including handpieces.

The potential for the biofilms in small diameter water lines to represent a reservoir of microbial colonization has recently become a topic of research. Microbial contamination of water lines may be due to the incoming water and oral microbial flora, which can contaminate the lines in retrograde fashion. Regardless of the cause, however, increased bacterial concentration has been seen in small bore water lines, and some organisms present in water may pose a theoretical risk to immunocompromised patients, such as the *Legionella* and *Pseudomonas* species.[28]

In one study, flushing dental unit water lines with water for 10 minutes resulted in the absence of immediately detectable bacteria, but viable organisms remained within the biofilm.[26] The organisms in the biofilm are resistant to disinfection. Although irrigation with bleach was shown to eliminate viable bacteria, the matrix for recolonization remained.[26] Self-contained dental water line units were shown to remain free of bacterial contaminants with appropriate attention to maintenance schedules.[26]

In contrast, another study found no significant differences in the numbers of colony-forming units of bacteria in stagnant water as compared with fresh water, and that flushing dental unit water lines with water for 10 minutes did not significantly reduce the numbers of bacteria isolated.[27] *Legionella* were detected in very low numbers in one-quarter of the dental units at a teaching dental clinic, and in higher numbers in four per cent of the units, primarily from one manufacturer.[28]

Because ethylene oxide is less corrosive than steam, and is available in some hospitals for sterilization, a study on the effectiveness of this technique for dental instruments was undertaken.[12] Handpieces were exposed to *Streptococcus mutans* and placed in either steam or ethylene oxide. They were then flushed with sterile saline for bacterial collection. No viable bacteria were recovered from the handpieces exposed to steam, but colonies were recovered from those exposed to ethylene oxide. The authors suggest that *S. mutans* may be incorporated in a biofilm, which may protect them from ethylene oxide.[12]

Discussion

The lack of epidemiologic evidence to support the transmission of infectious diseases via dental instruments and handpieces must be borne in mind, particularly when assessing laboratory studies. HIV is only infrequently recovered from the saliva of HIV-positive and AIDS patients, and even when it can be detected, it is present in low concentrations.[13] In addition, saliva contains factors that inactivate HIV and probably other viruses.[29-32]

Blood-borne viral pathogens may be present in the oral cavity but, when present, are at a much lower concentration than in blood. As stated, the potential transmission of blood-borne pathogens via dental instrumentation is not supported epidemiologically. Dental providers are not at increased occupational risk of acquiring HIV[33-40] and, other than the case in Florida, no other clusters of transmission of HIV have been linked to the delivery of medical care nor dental care.[1-3,41-47] Furthermore, the Florida cluster was not linked to dental instrumentation. In all clusters of transmission of HBV to dental patients, transmission has occurred from an infected health-care worker, where the provider was HBV-positive and carried a marker of high risk for transmission (HBeAg). Again, instrumentation has not been implicated, and provider-to-patient transmission is suspected.[36]

The implications raised by studies investigating infection following endoscopy may be valuable in the discussion of dental handpieces. Flexible endoscopes are used for internal investigative and therapeutic procedures in patients with symptomatic diseases. In many cases, these diseases are due to infection. However, flexible endoscopes, like dental handpieces, have proven to be difficult to disinfect and/or sterilize.

A recent review paper assessed the documented experience of infection following endoscopy, and identified a remarkably small number of cases of infection — 376 cases — despite the millions of endoscopic procedures that are conducted annually.[48] The results of infection ranged from asymptomatic colonization to serious disease. The common agents were *Salmonella, Pseudomonas,* and *Mycobacterium* species. One case of HBV transmission was documented following gastrointestinal endoscopy. The number of cases of infection reported were believed to represent a minority of all cases, for a number of reasons: for the most part, only easily-recognized infections with short incubation periods would be identified; low-level endemic transmission is difficult to detect; asymptomatic or self-limiting disease is unlikely to be recognized; and infections with long incubation periods are unlikely to be recognized. All reports of infection represent case reports or case series, and no prospective studies assessing infection as an outcome of endoscopy have been reported.[48] Careful disinfection and review of instrument design of endoscopes was suggested.

The fact that no epidemiologic evidence exists to suggest the transmission of blood-borne pathogens via dental handpieces may be due to multiple factors: blood-borne pathogens are rarely found in the oral cavity; when present in the oral cavity, blood-borne pathogens are in low concentration; anti-viral factors in saliva may inactivate the organisms; specific receptors for virus may not be present in the oral mucosa; and surface disinfection and removal of the dental bur reduce the quantity of potential pathogen retained in handpieces to a point below the level of infectivity. These factors may reduce the risk to a level where it either does not occur at all, or is extremely rare and therefore below the level of epidemiologic detection. Although no outcome-based studies have been done to assess the risk of infection following dental treatment, epidemiologic surveillance has not identified dental instruments in transmission of infectious disease.

Laboratory studies have shown the potential for dental rotary instruments to become contaminated. Also, recent studies of biofilms suggest that dental unit water lines have the potential to act as reservoirs for bacteria, which may ultimately contaminate the dental instruments. This clearly has implications in the dental setting. The site of organism retention, whether in the turbine, or in the air or the water lines of the instrument or unit, is not known.

HSV is similar to HIV in resistance to germicidal agents.[23] The results of our studies,[11,14] and the low concentrations of HIV in saliva, suggest that the infectivity of the viruses retained in contaminated dental handpieces may be destroyed by appropriate disinfection of the external and internal surfaces. It is anticipated that heat processing will be effective in this regard.

Using our laboratory model, we demonstrated that viable infectious virus, as opposed to nucleic acid or viral protein, can be recovered from dental handpieces after external disinfection. It is likely that the concentrations of virus present in our experiments were significantly higher than those encountered in recurrent asymptomatic HSV shedding but, in primary infection, particularly when symptomatic, the concentrations of virus may approach those used in our study.

We cannot extrapolate these results to HBV, because this virus appears to be more resistant to inactivation than HSV.[49] Infectivity experiments are difficult to perform due to the lack of an efficient cell-culture system for HBV. Furthermore, evidence suggesting viral resistance to disinfectant if the organisms are placed in dental lubricant in a laboratory study[10] does not prove, nor support the conclusion, that infection will occur in patients. The finding of low numbers of *Legionella* in dental unit water lines[28] is also likely of little consequence to the public, as similar colonization can occur in home water systems. However, there may be a potential for infection in immunocompromised patients.

The infrequent presence (and usually low concentration) of HSV in saliva, the frequency of the population with antibodies to HSV, and the ef-

fect of surface disinfection in reducing the viral load may explain the lack of evidence suggesting HSV transmission to patients during dental procedures. Also, the high frequency of asymptomatic primary infection and lack of follow-up, in addition to high endemic rates of infection, may be significant.

The effectiveness of anti-retraction valves in reducing contamination of dental handpieces and water lines has not been confirmed in all studies.[12,14,26]

No guidelines on the use of chemical agents for external and internal treatment of handpieces have been published. Our studies of HSV demonstrated the potential efficacy of external and internal high-level disinfection.[11,14] However, these studies involved a single human pathogen, and dental handpieces were not assessed for longevity or function after exposure to internal disinfection. Also, the recent study by Lewis and Arens[10] shows that organisms may be more resistant to disinfection when they are incorporated in the handpiece lubricant.[10] The studies conducted to date are therefore not adequate to establish guidelines for the non-heat sterilization of dental handpieces after clinical use. Our HSV model may be useful to researchers seeking additional measures to prevent or eradicate the microbial contamination of the internal channels of dental handpieces.

Recent studies on the potential for the biofilms present in dental unit water lines to contaminate instruments and/or transmit disease are of interest. Additional study is needed to determine if these biofilms pose any real risk to patients. It may nevertheless be appropriate to avoid using instruments that require water irrigation in severely immunocompromised patients. Treatments such as ultrasonic scaling should be avoided, particularly when hand instrumentation without aerosols can be used. In addition, if a closed water system is not in place, irrigation with sterile irrigant should be considered, in conjunction with high-volume suction, in severely immunocompromised patients.

To determine what actions should be taken as a result of the studies conducted to date, a discussion of the evidence required to formulate and present recommendations is called for.[50-52] The basic need is to identify whether exposed patients have an increased likelihood of experiencing a negative outcome compared to unexposed patients, all other factors being equal. In this context, we have to determine if a greater number of cases of infection have occurred in patients exposed to bacteria and/or viruses during dental treatment than in those not so exposed. The strongest level of evidence is the results of adequately designed, randomized clinical trials. Unfortunately, no studies have been done to assess infection as an outcome following dental or medical procedures. In the absence of prospective outcome studies, the next level of evidence can be developed from case-control studies. This is done by comparing infected persons to non-infected persons to determine if there is risk in receiving dental treatment. All of these studies have been negative. In addition, ecological studies can be conducted to determine whether populations of patients infected by HIV or other agents have undergone dental work more frequently than the non-infected populations. Again all such studies are negative.

Without any real evidence to suggest that people are at risk of infection as a result of receiving dental treatment, the question remains: Are people being exposed? The lack of prospective outcome based studies and the lack of evidence from case-control studies could result in a negative estimation of risk. This is not likely, however, as a large number of exposures would clearly occur based on the number of patients receiving dental treatment on a daily basis throughout the western world. The next issue to consider is whether the case-control studies are poorly done or too small in number to detect a risk that is present, but not yet high enough to make an intervention cost-effective. Careful studies of HIV in medical and dental practice have been negative, and no outbreak of HBV can be detected where dental instruments were a source of infection. In cases where transmission of HBV in the dental office has been documented, the dental worker was the human source (carrier of HBV).

The laboratory studies reviewed in this paper are reflected in the hypothesis that transmission may occur. But do the data allow a rejection in this hypothesis that there is a risk? This is a different research question, as almost all of our studies are based on determining when to reject the hypothesis of no risk (the null hypothesis). In fact, the principle of evidence-based practice not only allows, but requires, that treatment be based on evidence of need, or risk in the case of infection control procedures, and that in the absence of prospective outcome based studies, the available data and/or formal consensus proceedings be used for guidance.

The dental profession has responded to the studies reviewed in this paper by developing a series of recommendations for infection control. The American Dental Association (ADA) published a statement in 1992 that read: "Although no documented cases of disease transmission have been associated with contaminated dental handpieces or prophy angles, sterilization between patients with acceptable methods which assure internal as well as external sterility is recommended for these instruments."

Perhaps the most important part of the ADA statement is the first portion, which identifies the lack of epidemiologic evidence of disease transmission. In the United States, sterilization of handpieces between patients and other infection control procedures are required by the Occupational Safety and Health Administration (OSHA), and have been incorporated into law in some states.

Similarly, the U.S. Centers for Disease Control and Prevention have stated that "routine between-patient use of a heating process capable of sterilization (i.e. steam under pressure [autoclaving], dry heat, or heat/chemical vapor) is recommended for all high-speed handpieces, low-speed dental handpieces, low-speed handpiece components used intraorally, and reusable prophylaxis angles. Manufacturers' instructions for cleaning, lubrication, and sterilization procedures should be followed closely to ensure both the effectiveness of the sterilization process and the longevity of these instruments. According to manufacturers, virtually all high-speed and low-speed handpieces in production today are heat tolerant, and most heat-sensitive models manufactured earlier can be retrofitted with heat-stable components."[53]

The CDC also suggests that anti-retraction valves should be installed and that handpieces should be run to discharge water and air for a minimum of 20 to 30 seconds after use on each patient.

CDA published recommendations for infection control procedures in 1988, which state: "Handpieces and similar intraoral devices should be sterilized according to the manufac-

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turers directions: if not sterilizable, they must receive appropriate high-level disinfection."

CDA has also included the following statement in a publication entitled *Guidelines for Implementation of Infection Control Procedures*: "Most modern handpieces are capable of being sterilized by steam or chemical vapors, and this should be an important consideration on purchasing new or replacement pieces. To maintain this instrument in working order for a lengthy period, the manufacturer's directions regarding the nature and sequence of cleaning, lubricating and sterilizing the handpiece must be precisely followed. Immediately after use it is wise to flush water throughout the handpiece for 20 to 30 seconds to remove any oral fluids which may have been aspirated into the handpiece if a retraction valve is not present. Additionally, it is good practice to flush out the water line prior to re-attaching the sterilized handpiece. Cleaning of the handpiece prior to sterilization usually involves wiping its surface with a hot water and detergent solution to remove all visible debris. The use of non-sterilizable handpieces is not recommended; however, handpieces which cannot be sterilized must be subjected to a high level disinfection. This should be performed by a tuberculocidal disinfectant and since it is being applied to the surface of the handpiece iodophore or phenolic compounds are recommended. After flushing water throughout the handpiece, it is disconnected and cleaned in the usual manner. A 4 x 4 gauze is soaked in the liquid disinfectant, wrapped around the handpiece, and left for 15 to 30 minutes. Afterwards, residual disinfectant may be removed by wiping with sterile water or alcohol-soaked gauze. The water line is flushed again for 20 to 30 seconds and the handpiece reattached. Air/water syringes and ultrasonic scalers should be treated in a similar manner as described for handpieces. Preferably, they should be sterilized but if not, high level disinfection is acceptable. Removable tips which can be sterilized are advantageous."

In British Columbia, the health hazards and health promotions committee of the College of Dental Surgeons of B.C. continues to review such recommendations, but has not changed the guidelines for handpieces, due to the lack of evidence of risk of transmission of infectious agents via such instruments. The current B.C. guidelines include the incorporation of anti-retraction valves, running the handpiece prior to and following patient treatment, surface disinfection with suitable high-level chemical disinfectant, and sterilization of the dental bur. This guideline describes a minimum standard and providers may, of course, use heat sterilization if desired.

The decision to heat process dental handpieces should be based on our current knowledge, which indicates: there is no evidence of disease transmission, there is a lack of prospective outcome studies to fully assess the risk of infection, that the available epidemiologic data shows no risk, and that laboratory studies show that potential human viral pathogens can survive in dental instruments. In addition, the impact of the heat process on the function and longevity of instruments, as well as the perceived public expectations with respect to infection control procedures should be taken into account.

In the final analysis, the decision to sterilize handpieces after each use should be guided by current research, as well as a continuing review of the literature. The development of recommendations without evidence of risk, other than a theoretical potential based on laboratory study, should be looked on very cautiously. Further study of the epidemiology of infectious diseases in the dental setting, and in related microbiology, is needed. ■

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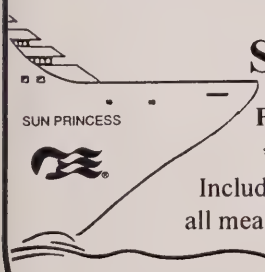

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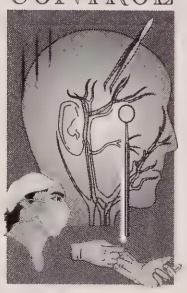

Dental Unit Water Contamination

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ABSTRACT

Bacteria-laden biofilms located on the lumen surface of dental unit water lines have resulted in the persistent and widespread microbial contamination of dental unit water supplies. These biofilms are resistant to chemical disinfection. As such, they act as reservoirs that facilitate the continuous re-contamination of dental unit water. The microbial populations of the biofilms found in dental unit water lines include opportunistic pathogens of unknown significance. Strategies to control the contamination are discussed.

Key words: *dental unit, water, biofilm*

SOMMAIRE

À cause des biofilms chargés de bactéries adhérant aux surfaces intérieures des conduites d'eau des appareils dentaires, l'eau de ces appareils est constamment et généralement contaminée par des microbes. Ces biofilms résistent à la désinfection à l'aide de produits chimiques. Comme tels, ils agissent comme des réservoirs qui favorisent la recontamination continuelle de l'eau des appareils dentaires. Les populations microbiennes des biofilms trouvées dans les conduites d'eau des appareils dentaires comprennent des agents pathogènes d'une importance inconnue. On explique des stratégies visant à lutter contre les risques de contamination.

Mots clés: *appareil dentaire, eau, biofilm.*

Introduction

Persistently high levels of micro-organisms, ranging up to about a million microbes per mL of water, have been documented in dental unit (DU) water for more than 30 years.[1-8] Two major contaminant sources, or mechanisms, have been identified in these studies.

Oral microbes may be drawn into the handpiece and, possibly into the attached water line, due to the transient suction that develops in the dental unit water line (DUWL) when the handpiece is turned off in the mouth. This mechanism has been identified as a cross-contamination risk as well as a major source of DU water contamination.[7] However, the risk of contamination can be minimized by the insertion of valves to prevent the suction effect, and by sterilizing handpieces.[9]

The second mechanism involves the release of microbes into the dental unit water supply from biofilms located on the lumen surface of DUWLs. It has been more controversial in terms of strategies to control the resultant DU water contamination as well as the possible clinical significance.

Biofilms

Biofilms are formed when planktonic bacteria adhere to surfaces in water-containing systems and produce a protective polysaccharide matrix. The matrix can trap nutrients. It can also protect microorganisms against a variety of antibacterial agents, including surfactants, biocides and antibiotics. This favorable environment leads to an increase in microbial numbers, both through cell division, and by further recruitment of other planktonic microbes.[10-12]

A number of factors favoring biofilm formation are present in DUWLs. These factors include the extended periods during which DUWL water is stagnant, a high ratio of lumen surface area to water volume, and tubing made from hydrophobic polymeric materials that favor bacterial adhesion (e.g. polyvinyl chloride, polyurethane).[13,14]

Influence Of Biofilms On Microbial Contamination In Dental Unit Water

As early as 1977, Kelstrup et al[15] linked the microbial aggregates found on DUWL lumen surfaces with the occurrence of high microbial levels in DU water. Several studies have since confirmed that DUWLs typically contain well-developed biofilms that may contaminate DU water supplies.[16-19] Although it is impossible to exclude oral microbes (which may be present in DUWLs due to retrograde spread from contaminated handpieces) as a factor in the formation of DUWL biofilms, it is clear that the DUWL biofilms can form readily in the complete absence of oral contaminants. A recent study found that water samples taken from dental units in clinical use and from units that

had never been exposed to patients contained similar concentrations and types of microorganism.[18]

Once established, a DUWL biofilm can efficiently shed microbes into lumen water. Even a single, brief pulse of sterile water, when passed through a relatively small (110 cm) detached piece of DU tubing containing a biofilm, can result in detectable levels of microbes in the dental unit water.[18]

DUWL micro-organisms are mostly heterotrophic, gram-negative, rod-shaped bacteria, which are not generally considered medically important.[15,18] However, *Pseudomonas* species,[20,21] *Legionella* species[22,23] and non-tuberculous *Mycobacterium* species[24] can occur, and may have significance. These three genera contain opportunistic pathogens that have been implicated in nosocomial waterborne infections.[25]

Free-living, non-pathogenic protozoa have also been identified in DU water. These organisms may have significance as host cells in which *Legionella* species can proliferate and possibly gain enhanced virulence.[14,23,26]

Some studies examining DU water have identified a much wider range of microbes, including some primary human pathogens.[1,2,19,27] However, these results may not be directly applicable to the problem of DUWL microbial contamination. Some results were derived from water samples drawn through instruments attached to DUWLs, or from units with contaminated self-contained water systems; others were derived from water samples taken at various times during the day in many different practice settings. Thus, the expanded range of microbes might represent contamination from clinical procedures, dental instruments or special circumstances unique to self-contained water systems.

The extent of *Legionella* contamination in DU water has caused special concern. This is because the well-defined mode of infection for *Legionella* — through aerosols derived from various water-containing systems — offers an obvious parallel to dental systems, which routinely generate aerosols. *L. pneumophilia*, the most significant *Legionella* pathogen, is implicated in about 85 per cent of *Legionella* pneumonia cases,[28] and has been found in a small percentage of DUs. Concentrations of *L. pneumophilia* in DU water are usually very low, however, and the extent to which this contamination differs from potable water supplies is uncertain.[23,29] Although one study[29] found repeated high *L. pneumophilia* concentrations in a particular DU model (Plan Meca 2000), these results were generally not repeated in other DU models. The high levels of *L. pneumophilia* could not be related to a specific pattern of clinical use. This suggests that DU design is an important predisposing feature to *L. pneumophilia* contamination. Of further possible significance, and in marked contrast, although other non-pneumophilia *Legionella* species have been identified in approximately similar percentages of DU and control potable water samples (68 per cent and 61 per cent respectively), concentrations of these species in DU water were often much greater.[23]

Significance In Dental Offices

A standard measure used to evaluate drinking water is coliform growth (as an indicator of fecal contamination). In a single study, all DUWLs met this water quality standard.[17] However, other studies that used a second microbial standard of water quality, and were conducted in multiple dental clinics, found that DUWL water samples routinely yielded heterotrophic microbial growths far in excess of the 500 cfu/mL level that is regarded as acceptable for drinking water.[19,27]

Although DUWL contamination has been recognized for more than 30 years, relatively few cases of disease have been attributed to this problem. Two case reports describing oral infections in immunocompromised patients exposed to *P. aeruginosa* in DU water have been documented.[21] A case of fatal legionellosis involving a dentist, which has been described but not yet adequately documented,[23] may have been caused by high concentrations of *L. dumoffii* in DUWLs.

There is currently a paucity of evidence to indicate that DUWL contaminants may cause infection. This has caused some clinicians and researchers to adopt relatively complacent attitudes to the problem of DU water contamination. These attitudes have been reinforced, probably inadvertently, by recommendations emanating from the U.S. Center for Disease Control (CDC), which indicate that DUWL contamination can be controlled by running water through DUs for a "few minutes" before clinical use.[30] This suggests that DUWL contamination can be managed by a simple practical procedure. However, there are two major arguments against widespread acceptance of this approach.

First, the practice of running water through DUs before use, to reduce DU water contamination, might not be reliable, and even extensive flushing may not bring microbial levels below recommended limits.[5,27,31,32]

Second, and more important, the low documented incidence of infections resulting from exposure to DU water could be misleading. As previously noted, a considerable number of cases involving water-related nosocomial infections, caused by opportunistic pathogens similar to those found in DU water, have been documented.[25]

Contaminated DU water could theoretically cause infection, particularly in immunocompromised patients, by directly inoculating bacteria into damaged tissues. Infection could also result through the aspiration of aerosols generated from contaminated DU water. It is possible that DU-water associated infections have not been recognized because of the lack of any obvious connection between the time of exposure to contaminated DU water and the development of infection.[25] In addition, clinicians have not been sensitized to a possible causal association, because the appropriate literature documenting such an association has not been published.

The recognition that DU water is frequently contaminated by non-pneumophila *Legionella*, and

occasionally by *L. pneumophilia*, has created particular interest in the possible pathogenic roles of these organisms. This is because many dental procedures produce aerosols in close proximity to the patient and clinician, creating seemingly optimal conditions for infection. The available evidence suggests that chronic exposure to the microbes in DU water has the potential to produce an immunological host response. A significantly greater fraction of dental care workers develop *Legionella* antibodies relative to control groups.[33,34] However, no cases of *Legionellosis* were identified in studies that specifically assessed chronically exposed dental groups for infection.[22,35]

Control Of DU Water Microbial Levels

Various approaches have been examined to control DU water contamination.[36] These include the use of special systems with removable autoclavable parts, as well as the use of self-contained systems that rely on sterile water. Other approaches use antibacterial chemical preparations. Antibacterial chemical preparations containing povidone-iodine,[37] Tween 80;[15] chlorhexidine,[2,4] Stericol,[4] hydrogen peroxide[12,15,38] and sodium hypochlorite[4,8,39] have all been investigated with varying degrees of success. However, the resistant biofilm acts as a reservoir for micro-organisms, and facilitates the rapid recontamination of the water supply following disinfection attempts.

Microfiltration systems that can be used with existing equipment seem to be a particularly promising approach. This involves the insertion of disposable filters at the end of the DUWL.[40]

CDC's recommendations for control of DUWL contamination, alluded to previously, indicate that water lines should be flushed for "several minutes" at the beginning of each clinic day.[30] The effectiveness of this procedure has been challenged by some authors, who report that bacterial clearance was variable, often minimal, and sometimes even increased following this procedure.[5,27,31] Other studies [2,6,17,18,41] suggest the CDC guidelines, while somewhat vague, produce substantial reductions in DU water microbial contaminants. A study conducted at our institution[18] indicated that the flushing times required for bacterial clearance vary substantially. Nevertheless, seven of the 11 units tested showed almost complete clearance after five minutes of flushing, with the remaining four units showing relatively low bacterial levels (mean value of 490 cfu/mL). All units had non-detectable levels of bacteria after 20 minutes of continuous flushing. The same study assessed the DU re-contamination times. These results were also quite variable. Units tested positive in time periods ranging from 30 minutes to 12 hours.

It is not clear why the different studies have shown inconsistent results. Different water sampling protocols (testing water ejected from an attached instrument or directly from the DUWL), or different culture protocols may account for some of the differences.[31,41] The contribution of the connecting plumbing system could also affect the results. At least two studies have demonstrated microbial contamination directly from the connecting plumbing in large dental clinics.[8,15] In some plumbing systems, unique factors related to the plumbing's construction or age, as well as the water quality and other non-specified environmental conditions, could further generate or sustain biofilms. This would cause a more generalized contamination that would be resistant to flushing water through dental DUs. It also seems that different DU models may be more disposed to contamination.[29] Furthermore, other DU parts, such as filters or fittings that trap debris, could contribute to the contamination. Thus, running water through DUs to control DUWL contamination is an approach which should be applied with discretion, reflecting the variability specific to different units or clinical settings.

Summary and Conclusions

1) DU water contamination is a generalized problem. Water from any previously inactive unit should be regarded as having high microbial levels unless proven otherwise.

2) Running water through DUWLs for several minutes can substantially reduce microbial levels in DU water. The extent of the reduction and the elapsed time before re-contamination appears to vary depending on the unit or connecting plumbing. The various strategies discussed in this paper should be considered as adjuncts in the decontamination of DU water.

3) DU water contains opportunistic pathogens of unknown significance. However, there is sufficient theoretical basis to recommend that dental procedures should not be performed on severely immunocompromised patients unless the DU water can be demonstrated to meet, at a minimum, the quality standards for potable water.

4) More work is required to more closely confirm or define the existing CDC protocol to control DU water microbial contaminants in existing equipment. It is not clear whether flushing DUWLs with water to reduce microbial levels, as described in previous studies, will also reduce the levels of *Legionella* species, since it is difficult to detect these organisms using conventional culturing methods. The general medical significance of DU water contamination should be investigated more carefully, since the population of immunocompromised patients requiring dental treatment is likely to increase. Strategies to control biofilm development should be developed. ■

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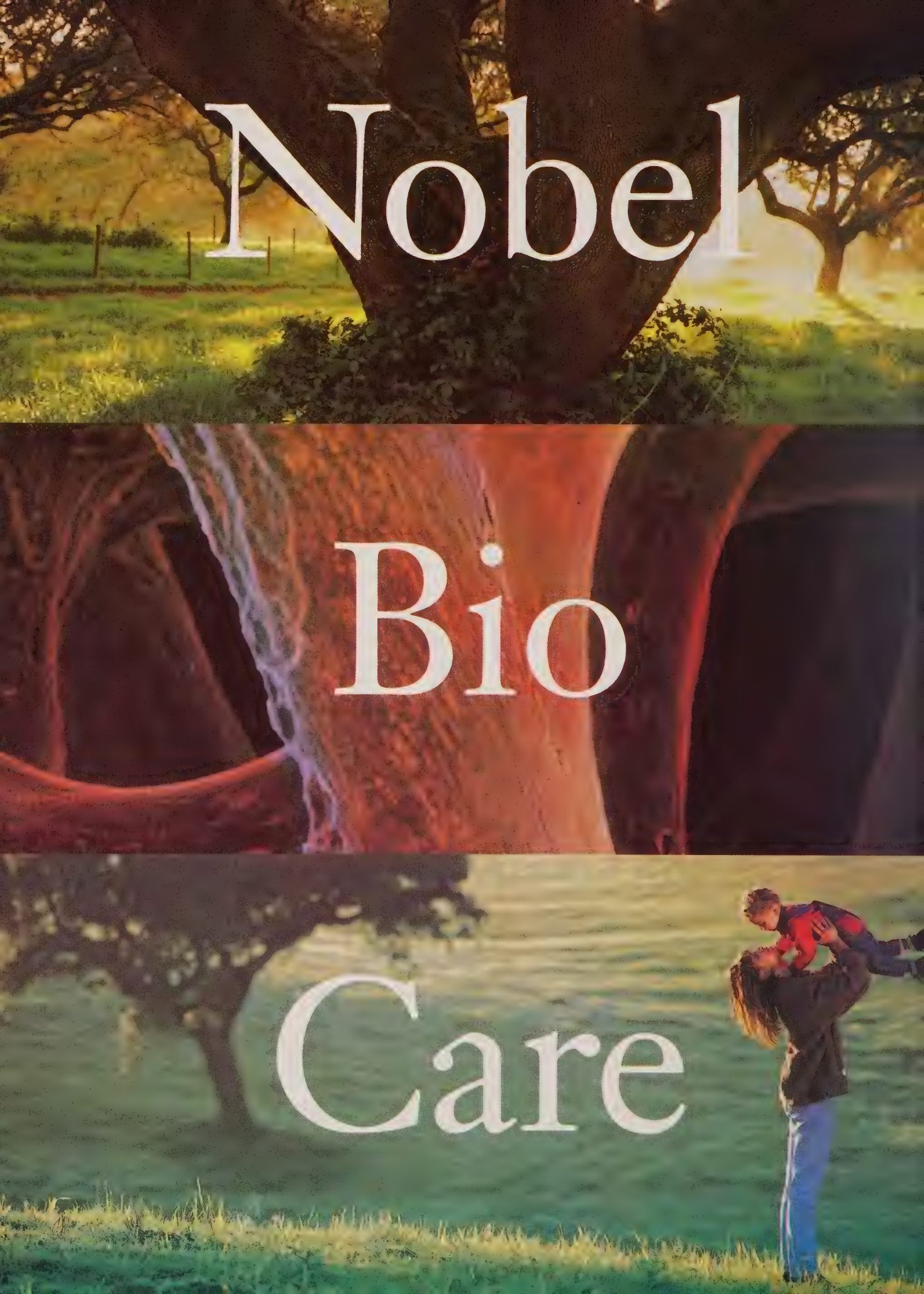
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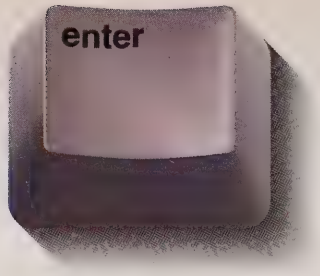

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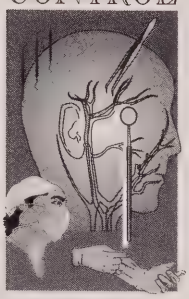

Danger Of Inter-Patient Cross-Contamination From Saliva Ejector Suck Back

Ronald L.S. Whitehouse, PhD

Despite the dental profession's increased awareness of the potential for infectious micro-organisms to be spread between individuals in the dental office, and the increased emphasis given to infection control in recent years, one potential route of spread largely escaped attention until 1993.[1] This route involves the transfer of micro-organisms from the oral cavity of one patient to the oral cavity of the next patient through the saliva ejector.

Dentists and dental hygienists typically replace the saliva ejector tip between patients. Most have presumed that this hygienic safeguard is sufficient to prevent any cross-infection. But is it?

In their study, Watson and Whitehouse[1] found that the flow of liquid in the saliva ejector may be reversed under certain conditions. If this occurs, liquid in the suction hose to which the ejector tip is attached (i.e. liquid from beyond the saliva ejector tip) can reach the patient's mouth. This liquid may contain infectious micro-organisms.

Watson and Whitehouse's study involved aspirating red dye into a disinfected suction hose and attaching a transparent saliva ejector tip. The tip was then placed in the patient's mouth in a normal fashion, and the patient was asked to close his or her lips around the tip. Under certain conditions, it was apparent that the liquid in the suction hose could travel in the reverse direction and into the patient's mouth. This back flow only occurred when patients closed their lips around the saliva ejector tip.

Watson and Whitehouse's observation was surprising. Saliva ejectors are designed to remove liquid from the patient's mouth, not add it. In this study, which involved different individuals and different dental units, and in a subsequent unpublished study, the researchers observed dye in the transparent saliva ejector tip in about 30 per cent of cases. Dye reached the mouth end of the tip in about 15 to 20 per cent of cases.

Campbell, Mann and Crawford,[2] in a report of a preliminary study, confirmed that back flow could occur from saliva ejectors. They determined that this back flow was a direct result of decreased pressure in the suction line due to the simultaneous activation of the high volume evacuator.

Although Watson and Whitehouse did not investigate all of the conditions that might contribute to the reverse flow phenomenon, they tested a number of different dental units under a variety of different conditions. Their research encompassed dental units in large and small dental practices, dental units used during a busy day in multi-operatory offices, and units used after hours, when only a single dental operatory was in operation. They also tested clinic situations where several units were in use at one time, but no operator was using the high volume suction line on the same system.

Watson and Whitehouse found that suck back could occur under all of the conditions tested. Interestingly, they determined that occlusion of the end of the saliva ejector tip by tissues in the mouth was not necessary for the reverse flow to occur. In fact, it usually prevented active suck back.

According to Watson and Whitehouse, the scientific explanation of the suck-back phenomenon is that some patients, when they close their lips around the saliva ejector tip, effectively seal their oral cavity. This occurs when patients close off their throat (as is done in preparation for sucking) at the same time as they close their lips around the ejector tip. In these cases, the suction line (vacuum system) removes liquid from the oral cavity until it meets resistance. At this point, due to the momentum of the liquid travelling away from the mouth, the pressure in the oral cavity is temporarily decreased to a level that is below the pressure created by the suction force. Liquid is then "bounced" back into the mouth to equalize the pressure.

It is important to note that the reverse flow does not depend upon the patient sucking the ejector tip. In an unpublished study, Whitehouse and Shields (Watson) demonstrated dye suck back using a 50 mL Erlenmeyer flask con-

taining water. The researchers inserted the saliva ejector tip into the flask through a stopper. This effectively sealed the flask, simulating the sealed oral cavity.

Based on a survey of 117 local dental practices,[1] only 23 per cent of dentists reported that they rinse or disinfect suction hoses between patients. At the same time, when Watson and Whitehouse[1] tested the end sections of suction hoses after they had been used on patients, they found viable bacteria that are typical of the oral cavity. In a subsequent unpublished and more elaborate study of eight dental units in the University of Alberta's dental hygiene clinic, an average bacterial count of 2.8×10^5 (range 5.5×10^3 to 5.5×10^5) colony forming units was found in the end 11 cm of the suction hose. Fifty per cent of these colonies were alpha-hemolytic, a proportion typical of the oral flora. Although Watson and Whitehouse did not look for pathogenic bacteria, they found some beta-hemolytic colonies in one patient. These colonies were not investigated further.

If oral bacteria remain behind in the suction hose and may be transferred to the next patient's mouth by the reverse flow, so could pathogenic bacteria and viruses which may be present in high numbers in the oral cavity under certain conditions. These infectious agents could then be transferred to the next patient's mouth by reverse flow, or suck back.

Blood is frequently present in the fluids aspirated from the oral cavity during dental or dental hygiene treatment, and the gum tissue of the next patient being treated is often sensitive, damaged, and more vulnerable to infection. In certain infections, such as hepatitis B, viruses are present in enormous numbers in the blood of patients and carriers. In bacterial (e.g. strep throat) and viral (e.g. influenza, colds) upper respiratory tract infections, the causative organisms are present in large numbers in the fluid in the oral cavity.

Piazza et al,[3] in a region of Italy with a high incidence of hepatitis B carriage, tested various pieces of dental equipment and sites in the dental office for hepatitis B surface antigen (HBsAg). They detected hepatitis B surface antigen in several locations and on various pieces of equipment in the dental office, including one of 19 suction units tested (the precise part of the unit was not specified).

More recently, Piazza et al[4] found that hepatitis C viral RNA could be detected from various surfaces and instruments, including one of 35 suction units tested (again, the specific part of the suction unit tested was not specified), following the dental treatment of patients who tested positive for hepatitis C viral RNA. These authors stressed the importance of adequate sterilization and disinfection to prevent the possible risk of transmission of the virus to susceptible individuals.

Although there are no reports of infectious diseases being transmitted from patient to patient as the result of reverse flow in a saliva ejector, this mode of cross contamination has not yet been widely investigated or supported.

The risk of inter-patient contamination due to saliva ejector back flow can be virtually eliminated if dentists take three simple precautions:

1. Patients should be told not to close their lips around the conventional saliva ejector tip. However, patients may still do this by accident, especially children, and so it cannot be relied upon.

2. As well as replacing the saliva ejector tip between patients, the vacuum hose should be effectively disinfected and rinsed. In those cases where liquid is sucked back into a patient's mouth from the suction line, this will ensure that the liquid contains no material or organisms that were present in the previous patient's mouth. It is important to rinse adequately, however, to ensure that the suction line is also free of disinfectant. Although the disinfection and rinsing procedure is time consuming for the already busy dentist/dental assistant/dental hygienist, and incurs additional costs, it must be done properly to be effective.

3. A newly-designed, safe saliva ejector tip prevents back-flow even if the lips are sealed around it. This safety tip will be produced and marketed in Canada this summer by White Shield Inc. ■

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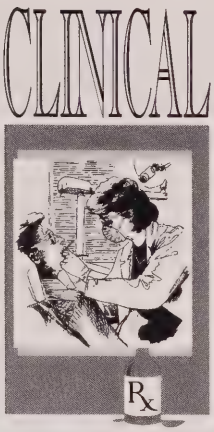
DID YOU KNOW?

The workers at a bakery in Connecticut used to play a game at lunch time. They would play catch with tin pie plates from the bakery. The game became so popular that the company started making plastic toys like the pie plates. They called the toys Frisbees. That's because the place where the pie plates were first tossed was called Frisbie's Bakery.



Successive Cusp Build-Up: An Improved Placement Technique For Posterior Direct Resin Restorations

William H. Liebenberg, B.Sc., BDS (Rand)

Introduction

Although current scientific consensus supports the continued use of dental amalgam as a safe, efficacious restorative material for most patients, the validity of this position is likely to be debated on an emotional and scientific level for some time to come. Recent media reports on amalgam safety have brought the amalgam debate into the public domain, and increased public concern about mercury exposure. This has led some patients to request the removal of their amalgam restorations. It has also resulted in many patients presenting with clear and strident views on amalgam, and an insistence that only tooth-colored, non-amalgam-based restorative options should be used.

Regardless of our own views on amalgam, we, as clinicians, should provide patients with information about all the available restorative alternatives. In addition, if direct composite resin restorations are to be part of our restorative repertoire, we are obligated to deliver them with technical diligence. Clinical success with resin restorations, while multi-factorial, is overtly dependent on operative performance. The rites of modern adhesive dentistry bear little semblance to the time-honored amalgam preparation, placement and finishing techniques that we learned in dental school. Clinicians therefore have a duty to seek out new and innovative techniques that will increase their ability to provide successful tooth-colored restorations.

Recent developments in adhesive dental technology have added a new and provocative impetus to the evolving epoch of restorative dentistry. Resin and the other tooth-colored restorative options have likely been subjected to more intensive and critical investigation than any other restorative methodology currently in use. Although most restorative developments in dentistry have evolved over time, there have been a number of marked breakthroughs that have highlighted just how capricious the principles of operative dentistry are. Both clinicians and patients have benefited from these breakthrough developments, as they clearly identified the biologic and physicochemical shortcomings of earlier adhesive systems.

A number of factors can affect the clinical success of direct posterior composite resin restorations. This article discusses those factors, as well as a new cusp build-up technique that enables the operator to form anatomically-correct morphology in the final occlusal resin increments.

Informed Consent

Clinical and public interest in direct esthetic restorations is not a new phenomenon, and our current enthusiasm for these methodologies should be tempered by the clinical evidence of earlier adhesive efforts. Although our previous adhesive shortcomings have been largely identified, not all of them have been satisfactorily addressed. Until all our concerns are addressed through clinical investigations using standardized protocols, clinicians should apply the principle of fully-informed consent to all adhesive procedures.

Dental research is steadily moving toward the ideal composite (enamel-like) material. The goal is to identify a long-lasting material that will bond to tooth structure in the presence of saliva. Until this ideal material is available, however, we have an obligation to advise patients that our restorative efforts, while delivered with the best of intentions, will need periodic "refurbishing."

A key consideration in composite selection is the intraoral site. Of all teeth, first molars are in contact with food most often and encounter the greatest direct stress. Wear caused by the food bolus occurs most rapidly on the occlusal composite restorations in first molars. The ranking of wear is: first molar restorations, second molar restorations, second premolar restorations, first premolar restorations.[1]

In clinical practice, many of our restorative options are limited by the patient's financial situation. When patients are forced to forego an ideal indirect ceramic restoration, a well-placed, less-than-ideal direct composite resin may be the best compromise treatment, particularly for patients seeking a

non-metallic restoration. Furthermore, if a less-than-ideal application of a restorative efforts must be used, composite resurfacing may provide a successful and simple way to manage these patients.

While some investigators focus on the cusp-reinforcing properties of composite resin restorations, their longevity has been questioned. A 1986 study by Eakle reported that the reinforcement associated with resin bonding may decrease with time.[2] Patients must also be advised that a restoration's initial esthetic appearance does not guarantee durability and maintenance of quality.[3]

Clinical experience has shown that oral fluids, as well as dietary habits, influence the quality and durability of composite resin restorations. In fact, composite resins undergo hygroscopic expansion, and exhibit pigmentation, marginal microfractures, infiltrations, increasing superficial roughness, and plaque retention. This suggests that the patient's oral hygiene may be equally important to the success of resin restorations as the dentists's operative procedures and the clinical performance of the material.[4]

Dental Dam

It has been shown conclusively that the benefits of bonding are enhanced when dental dam is employed.[5] As there are no known exceptions to this basic guideline, adhesive restorations should always be placed with the aid of dental dam. In fact, the routine use of dental dam isolation will likely continue to be associated with quality patient care for some time to come.[6]

Recent data regarding dentin bond strengths suggest that the presence of moisture (not saliva) may be advantageous. Contrary to what one would expect, this "wet bonding" protocol places even greater emphasis on the quality of isolation achieved. Contamination within the dry field of the traditional desiccated approach is no longer visually detectable. Put simply, you cannot see saliva leakage around a tooth that is already moist. On the other hand, contamination within a dry field is easily seen. Therefore, contrary to the implication of the generic "wet bonding" approach, dental dam application is not only mandatory, but the quality of the application must allow for uncompromised isolation. A less-exacting interim restorative option (using, for example, one of the newer polyacid-modified composite resins) should only be considered in those rare instances where a conservative esthetic option is indicated, and dental dam cannot be used. The definitive composite resin restoration can be done at a later date, once the conditions required for placement of the dental dam have been attained (one example would be clinical crown lengthening to restore biological width and place a restorative margin, equi- or supragingivally).

An effective technique for dental dam retention is shown in **Fig. 2**. The dental dam clamp has been stabilized with blobs of colored resin (green Nite White resin from Discus Dental Inc. was used here, but blue blockout resin from Ultradent products is equally effective).

In this procedure, the cervical area is given a quick run over with a rubber cup to remove the persistent pellicle/plaque that is invariably present on the buccal aspect of last molars. The clamp is applied ahead of the dam. It is stabilized digitally while the enamel, coronal to the jaws of the clamp, is spot etched for five seconds. This area is then rinsed and dried. The flowable colored resin is applied and light activated to stabilize the working field for the duration of the operative procedure. Colored resin is used to allow the clinician to detect resin tags left behind after the removal of the resin scaffold.

The expansive failure of the alloy restoration on the second molar cannot be blamed on the clinician's selection of materials, as the cavity dimensions of this restoration are ideal for alloy placement. In this case, failure was likely caused by salivary contamination during placement. The use of second maxillary molars as anchors is extremely difficult, as the smaller disto-palatal cusp precludes stable clamp engagement. This author has tried innumerable innovative techniques, various isolation devices, and several "recommended" clamps for second molars. Invariably, the selection and/or adaptation of the clamp is a challenging effort, given that caries experience peaks long before full eruption and gingival maturation. Partially-erupted second molars therefore require additional "retention" if isolatory procedures are to remain predictably stable for the duration of the operative effort. The author prefers to use an Ash PW clamp for second molars (stabilized with resin in more than 90 per cent of cases), and a Hager & Werken 205 clamp for first molars (stabilized with resin in less than 10 per cent of cases). The PW clamp is also ideal for deciduous second molars.

Importance Of First Layer Of Composite Resin

Light-cured composite resin begins to polymerize at the superficial layer closest to the irradiation source, and tends to shrink transversely away from the cavity margins. The underlying composite resin bulk subsequently polymerizes and shrinks toward the hardened superficial layer, which causes it to be separated from the cavity floor.[7] Most researchers agree that this gap, or separation, is ultimately responsible for postoperative sensitivity subsequent to bacterial infiltration, and the outward flow of the odontoblastic fluids.

The outward flow of odontoblastic fluids causes a reduction of pressure on the odontoblastic process, which generates pain. (Interestingly, Brannstrom showed that dentinal fluid passes through the tubules at a rate sufficient to empty the tubules 10 times in one day.[8]) It is obvious, therefore, that the primary goal of our adhesive effort should be aimed at establishing an effective barrier at the tooth/restorative interface.

The attainment of this goal requires a multifactorial approach. Clinicians are encouraged to refer to Swift et al's 1995 paper, which may be the most concise and lucid account of the art of bonding yet published.[9] Recent data suggests that the hybridization layer is not only important in terms of its sealing capacity, but also that the

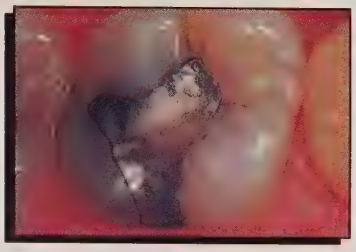


Fig. 1: Preoperative view of a maxillary molar displaying defective alloy margins plus cavitated dentin structure. Radiographically, there was no indication of interproximal involvement. Patient preference was for a tooth-colored restorative option.

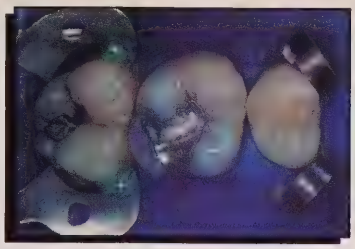


Fig. 2: There is no exception to the guideline that adhesive restorations are to be placed with the aid of properly applied dental dam. Retainers are easily stabilized with blobs of light-cured colored resin after partial spot etching.

Fig. 3: Restoration of the second molar is accomplished. Conservative cavity preparation is complete on first molar. In essence, healthy tooth substance should only be removed when extending the occlusal outline to beyond or within the functional stops noted preoperatively. Note the prerequisite sign of successful priming — a glistening dentin surface.

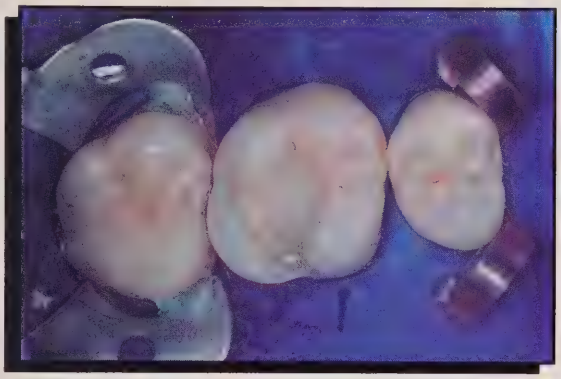


Fig. 4: Intra-operative view of the second increment. The first dentin resin increment is the most crucial. This is applied as the thinnest practical layer possible, and should involve no more than a smidgen of resin. More importantly it is applied to a single surface.

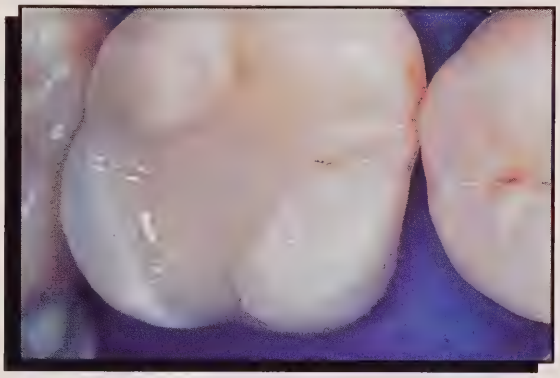


Fig. 5: The successive cusp build-up technique is begun in the same manner as the traditional methods. Resin increments are added in an apico-occlusal fashion. The height of the final horizontal increment is gauged by estimating the base of the occlusal fossae. This is done by extrapolating cuspal inclines from the adjacent teeth.

resin-impregnated layer has a lower Young's modulus of elasticity than the restorative resin. This allows the resin-impregnated layer to act as an inherent elastic buffering layer that is capable of absorbing the composite resin's curing contraction stress.[10]

The technique used by the author has not yet received a great deal of attention in the literature. It appears to be a logical choice, however, given the research data to date. The magnitude of the stresses that promote gap formation varies with cavity configuration. Single-surface restorations are preferred, as flow relaxation occurs within the composite resin during setting. This relieves some of the contraction forces. In three-dimensional cavity preparations, however, only the outer surface of composite resin is unbonded, so less flow is possible and much greater stresses occur.[11] The initial increment in the base of a three-dimensional cavity preparation should therefore be applied to a single surface. Clinicians are also encouraged to study the immediate bond strength values when they evaluate manufacturers' data concerning the bond strengths of the newer dentin bonding agents. Although 24-hour bond strengths are important, a 24-hour bond strength of 28 plus MPa is relatively meaningless if the initial one-minute bond strength is less than the contraction shrinkage of the restorative material.

The first dentin-resin increment is the most crucial. This is applied in the thinnest practical layer possible, and involves a "smidgen" of resin. More importantly, it is applied to a single dentinal surface — the base of the cavity is not covered with a 2.0 mm layer that contacts the surrounding and opposing cavity walls.

Successive Cusp Build-Up

The complex central sulcular areas of teeth are vital for intercuspation. Replication of the surrounding original anatomical form is extremely difficult, however. Re-establishing occlusal morphology with alloy requires sculpturing skill, which is dependent on artistic creativity and manual proficiency. This can be difficult when the occlusal morphology is re-established using resin, as the "sculpting" of the solid polymerized resin is accomplished mechanically with burs.[12,13]

Aside from the altered occlusal relationship of the "straight-lined," bur-finished restoration, excessive mechanical finishing has been associated with increased wear.[14]

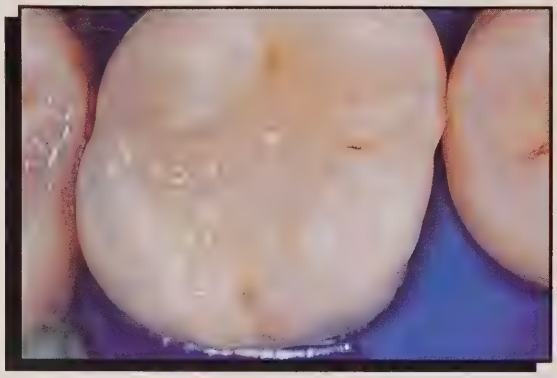


*Fig. 6: In the "successive cusp build-up technique," individual cusps are sculpted one unit at a time. Polymerization is initiated from the outside of the cusp surface at the completion of each distinct build-up. The position of the palatal groove is extrapolated from the cervical concavity (see **Fig. 3**).*

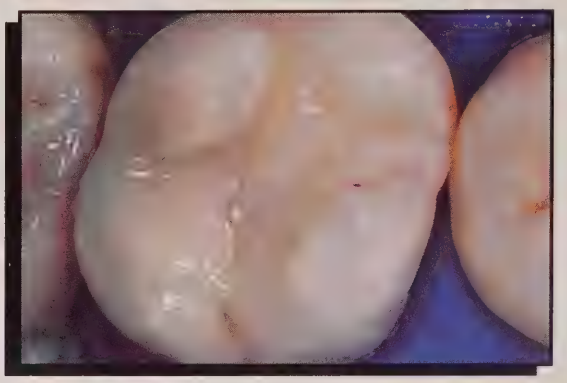


Fig. 7: In this "successive" way, the clinician is free to create and form anatomical details with precision. The entire occlusal morphology is restituted using the outlying cavosurface slopes and margins as a scaffold to guide composite shaping instruments.

The traditional overfill/cutback technique actually removes the most thoroughly-cured portion of the restoration. In addition, finishing has been associated with particulate de-bonding and severe patterned gouging. Wherever possible, the composite surface should therefore remain untouched.[15]

A common challenge faced by all light-cured resin material manufacturers is obtaining the correct "mix" of photo-initiator. If the mixture is too sensitive, the material will set before "condensation" and "carving" have been completed. Conversely, "slow" photo-conversion means a prolonged light exposure time. Small occlusal restorations are easily "formed" within the time limit. However, large multicusp applications are invariably over packed, "puddled" toward the cavosurface margin, and cured as the material begins to offer resistance. Overfilling is then rectified using time-consuming straight-lined bur reduction, which has been associated with increased wear of posterior composites.

The successive cusp build-up technique[16] presented below in a clinical case report describes the treatment of a 26-year-old patient with sensitivity to extremes of temperature in the maxillary posterior sextant (**Fig 1**). This technique is ideal for large complex-morphology-type teeth, as it allows the operator to form anatomically correct morphology without the usual time constraints (i.e. material curing due to photo-initiation from overhead operatory lights).

Clinical Procedure

1. Using articulation paper, the preoperative occlusal stops and excursive guiding planes are recorded and "held" on the monitor of an intraoral camera. Alternatively, these can be noted on a stone model or copied to a hand-drawn occlusal diagram. This record serves as a crucial "finishing" reference. More importantly, it allows the final cavosurface outline to be evaluated, in spite of the fact that dental dam, once applied, precludes articulation. Early data has indicated that resin to etched enamel bonds may not stand up under occlusal loading and thermal stress.[17] It is therefore advisable for all centric stops to be placed beyond or within the restorative tooth interface.
2. Anesthesia is administered, as indicated, and the dental dam is applied, taking care to ensure both the quality[6] and stability of the isolation set-up (**Fig. 2**).
3. Using a caries disclosing solution, the decayed and/or defective tooth/restoration is removed according to recent conservative guidelines (**Fig. 3**). In essence, healthy tooth substance should only be removed when the occlusal outline is extended to a point beyond or within the functional stops noted preoperatively.
4. In Class II situations, matrices are secured and compensatory space is activated using a bitine ring system (Danville Engineering, Inc., is set to launch a modified version that includes a left and right, and two tine sizes).
5. This author does not use linings of any sort with direct composite resin restorations, as it has been adequately demonstrated that direct bonding to dentin is more efficient than indirect bonding through glass-ionomer or resin-modified glass-ionomer linings.[18] Although the short-term studies of adhesive pulpal success initiated by Bergenholtz, Cox, Kanca and other eminent clinicians[19] have been impressive, they provide no guarantee of long-term results. Clinicians are encouraged to follow the literature for future developments in this field. However, current studies show that the total lining function can be achieved with modern adhesives alone, ending the requirement for varnishes and cements to be used. This concept may appear iconoclastic in North America, but it has been studied and practised with impressive results in other parts of the world for more than 15 years.[20]
6. A final check of dental dam effectiveness is required, as the remainder of the adhesive pro-

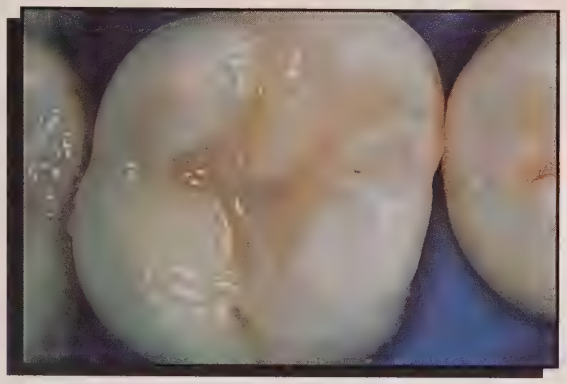


Fig. 8: Tints and characterizing resins are best applied to the base of the last horizontal increment, as depicted in this close up view. The mesio-palatal and disto-buccal cusps are then formed over the tinted resins.

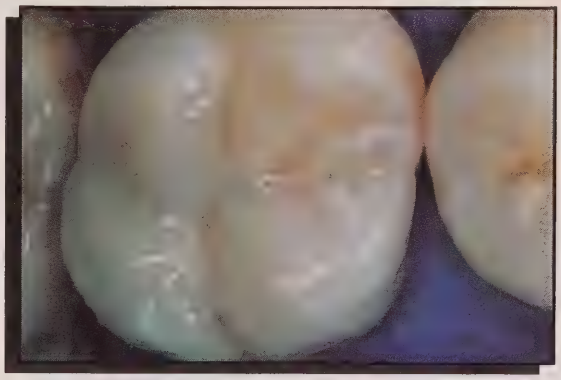


Fig. 9: The completed restoration. Note the high lustre and the imperceptible blending of restorative resin and tooth substance. The successive cusp build-up technique provides superior esthetic form and anatomical contour — qualities which are difficult to achieve using traditional bur-assisted contouring.

cedure will be carried out "wet" from here on.

7. Enamel and dentin are etched simultaneously for 15 seconds, with 37 per cent phosphoric acid. The area is washed and excess water is lightly blown away. Cotton has shown that the direct application of air to a cavity for 30 seconds, using an air chip syringe, causes odontoblastic cell disruption. It is therefore important to exercise caution, and to use the air syringe with care (short time-periods) when dealing with vital dentin.[21]
8. Although some of the newer adhesives contain a glutaraldehyde component that acts as an antimicrobial agent, this author prefers to include an additional "disinfecting" step. A four per cent chlorhexidine gluconate solution is used for this purpose. It is best applied with a sponge pledget, and then lightly dried to retain a wet surface. Following disinfection, the bonding primer is applied. Gwinnett has shown that there are no adverse effects on shear bond strengths to resin as a result of cavity disinfection.[22] Disinfecting agents are best applied after acid etching because the smear layer is removed by conditioning. It is therefore redundant to disinfect the dentin surface prior to this point. Acid etching exposes the critical underlying tissue to the action of the disinfecting agent.
9. The primer and adhesive of the chosen dentin adhesive is then applied according to the manufacturer's recommended protocol. Any excess of the final adhesive solution should be mopped up and redistributed with a dry brush, particularly in areas where pooling is anticipated. Excess solution should not be removed with a stream of air, as the material (usually in the region of 40 µm in thickness) is easily displaced.[23]
10. The successive cusp build-up technique is initiated using the same techniques employed in more traditional methods, where resin increments are added in an apico-occlusal fashion. The first composite resin increment is applied to the base of the cavity. As discussed above, it is imperative that this first layer is applied to a single surface (without touching the proximal walls), and that it be as thin as physically possible. Subsequent layers are in the order of 1.0 mm to 1.5 mm in thickness (**Fig. 4**), as small increments undergo less polymerization shrinkage.[24]
11. The height of the final horizontal increment is gauged by estimating the base of the occlusal fossae. This is done by extrapolating cuspal inclines from the adjacent teeth (**Fig. 5**). The cusps are then built up one unit at a time (**Fig. 6**). In this way, the clinician is free to create and form anatomical details with precision. The cusp increment is then cured from the outside of the tooth and polymerization shrinkage is directed toward the tooth/restorative interface. It has previously been demonstrated that composite resin can be photo-polymerized through cavity walls or undermined enamel cusps.[25] Additional curing is then accomplished through surface approximation of the light source to the occlusal portion of the cusp increment.
12. The opposing contralateral cusp is then formed and cured in the same way (**Fig. 7**). At this point, light-cured surface characterizing resin modifiers (Heliotint, Vivadent Ivoclar; Prisma tints, Caulk/Dentsply) can be added to the base of the completed cusps (**Fig. 8**).
13. In this successive way, the entire occlusal morphology is restituted (**Fig. 9**) using the outlying cavosurface slopes and margins as a guiding scaffold for the clinician's composite shaping instruments. While the author has not yet applied SEM (scanning electron microscopy) observations to the inner surfaces of this technique, data from Eick and Welch has shown that a buccolingual layering technique generated the

Fig. 10: The rubber dam is removed in preparation for occlusal adjustments and finishing. High spots are reduced with a pear-shaped intensive bur and polished using rubber finishing tips (Politips, Ivoclar Vivadent).

Fig. 11: The final postoperative appearance bears testimony to the notion that posterior composite resin restorations have evolved into a meticulous and predictable science. Improved placement techniques may enhance the performance of current formulations of posterior composite resin over their predecessors.

best adaptation and the least amount of polymerization shrinkage.[26]

14. Inadequate polymerization diminishes the physical properties of composite resin.[27] Loss of intensity, and hence curing capacity, could be a particularly significant problem when close approximation of the curing tip is impossible. Curing times should be extended if light intensity is reduced by distance or other factors. The surface hardness of composite resin is relatively unaffected by curing tip distance or light intensity. The bottom hardness is substantially lower than the top hardness at any curing distance, however, and declines as the tip is moved further away.[28] Using a sponge pledget, a surface layer of glycerine gel is applied to the entire restoration before the final polymerization exposure. This allows for the complete polymerization of the 50 micron surface layer. If gel is not applied, the polymerization of the surface layer will be inhibited because of its contact with atmospheric oxygen. However, the application of gel is not required if the restoration is subsequently "finished" with a surface-penetrating sealant (SPS). In this report, the final polymerization exposure is done without glycerine (**Fig. 10**), as a SPS is to be employed.
15. The dental dam is removed in preparation for occlusal adjustments and finishing. With the described techniques, inadvertent gouging, chipping and reduction of the cavosurface margin are minimized, as the surrounding enamel margins serve as a reference scaffold during occlusal sculpting. High spots are reduced with a pear-shaped intensive bur and polished using rubber finishing tips (Politips, Ivoclar Vivadent). It is clinically relevant — and therefore important — to use proper finishing and polishing techniques with resin composite restorations, and to achieve smooth surfaces. Bacterial accumulation may occur on rough restoration surfaces. It has been shown that bacteria have differing adherence potentials, which are related to surface roughness.[29] The proximal flash areas associated with Class II restorations are best finished with flexible discs, and not burs, as the possibility of damaging the marginal adaptation seems to be greater with burs and diamonds than with flexible discs.[30] A final high-quality polish is accomplished using a fine (RDA 7/REA 2) abrasive paste of Proxyt (Ivoclar Vivadent).
16. The use of a surface penetrating sealant (SPS) has been shown to reduce the wear rate of posterior composite resin restorations.[31] In addition, the penetrating potential of the sealant allows it to fill in the microstructural defects at the restoration/preparation interface. Marginal integrity is therefore effectively enhanced (**Fig. 11**). It is reasonable to assume that our sculpturing efforts have the potential to disrupt the integrity of the restoration/preparation interface. After finishing, the surface of the restoration is reactivated with 37 per cent phosphoric acid for 10 seconds. The SPS (Fortify, Bisco Lombard, Ill.) is applied with a brush, allowed to penetrate the restoration/preparation interface for 10 seconds, carefully thinned with compressed air, and polymerized for 60 seconds.
17. As a final step, a layer of Fluor Protector C (Ivoclar Vivadent) is applied to the restored teeth, particularly the cervical areas, which are often exposed to the effects of our conditioning efforts. Fluor protector is a polyurethane-based difluorosilane in a varnish base. It is easy to apply and cures to a clear, transparent film on the tooth surface. It has to be applied to a completely dry surface, and assures intimate contact for up to two days following application. Research has shown that the outside of the enamel is coated with a "CaF2-like" 10 µm to 20 µm layer after

a single application of Fluor Protector C, and that 3,259 ppm of fluoride is found in the enamel at a depth of 2.2 µm.[32] The fluoride varnish should be applied to the necks of the specific teeth that will be used to anchor the dental dam retainers. SEM analysis has revealed that the application of dental dam clamps may result in depressive disruption of the dentin and cementum.[33,34]

Conclusion

The adhesive revolution has begun to allay past reservations about posterior composite resin restorations. These reservations stemmed from previous experiences with outdated techniques, materials and operative skills. However, today's improved placement techniques have enhanced the performance of many current formulations of posterior composite resin over their predecessors.

It is ultimately a clinician's skill and knowledge that determines the quality and longevity of a restoration. The search for qualitatively equivalent, but definitely simpler, placement techniques must continue. This article presents one of the author's solutions to attaining adhesive excellence with direct composite resin. The technique provides esthetically pleasing anatomical form, color stability, undetectable margins, minimal postoperative sensitivity, maintenance of vitality, and a bond which can weather the true test of success — durability. ■

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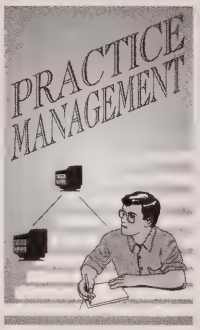

Dental Office Ergonomics: How to Reduce Stress Factors and Increase Efficiency

Risa Pollack, CMC, CDA, RDA

ABSTRACT

Ergonomics, the science that studies human stress and strain related to activities, has one primary objective — to prevent work related musculoskeletal disorders, or symptoms that aggravate these disorders.

Smart business owners have adopted the practice of ergonomics as an integral element in their ongoing strategies to increase productivity and ensure reduced workers' compensation liability. In British Columbia, however, potentially expensive ergonomic draft regulations created by the province's Workers' Compensation Board in 1993, have been put on hold. These ergonomic standards — described as the stiffest in the world — were to have been implemented across the province in early 1995. Nonetheless, ergonomic practices are alive and thriving in Canadian businesses that are devoted to ensuring a reduction in work-related injuries and salvaging potentially lost productivity.

Although it is difficult to document lost productivity, Ontario's Workers' Compensation Board reported that it received 707 repetitive stress injury claims from office workers in 1992, with a per person cost of $7,703. In addition to these costs, each claimant took about 93 days off work.

In dentistry, poor working habits, along with repetitive tasks, such as scaling and root planing, contribute greatly to musculoskeletal disorders, stress claims and lost productivity. Our tendency is to adapt awkward and illogical physical postures to access the oral cavity.

The key objective for clinicians is to find a position that allows them to achieve optimum access, visibilty, comfort and control at all times. With the professional goal to deliver the highest quality of care for a reasonable profit, the practice of ergonomics becomes a core focus in determining how to achieve practice success with less stress.

SOMMAIRE

L'ergonomie, la science qui étudie le stress et les tensions liés aux activités humaines, a pour principal objectif de prévenir les désordres musculo-squelettiques dus au travail ou les symptômes qui les aggravent.

Pour les propriétaires d'entreprise avisés, les pratiques ergonomiques sont un élément intégral des stratégies qu'ils mettent continuellement en oeuvre pour hausser la productivité et s'assurer de réduire le nombre des indemnités versées aux travailleurs. En Colombie-Britannique, cependant, un avant-projet de loi ergonomique potentiellement coûteux que la Commission des accidents de travail de la province a formulé en 1993 a été arrêté. Décrites comme les plus sévères au monde, ces normes ergonomiques devaient entrer en vigueur dans la province au début de l'année 1995. Néanmoins, dans les entreprises canadiennes qui veulent réduire le nombre des accidents de travail et récupérer la productivité potentiellement perdue, les pratiques ergonomiques sont vivantes et se portent bien.

Bien qu'il soit malaisé de documenter la productivité qui se perd, la Commission des accidents de travail de l'Ontario a déclaré qu'elle a reçu, en 1992, 707 demandes d'indemnité de commis de bureau pour exposition permanente au stress et qu'il en a coûté 7703 $ par personne. Outre ces coûts, chaque demandeur s'est absenté du travail environ 93 jours.

En dentisterie, on tend à adopter des postures physiques étranges et illogiques pour avoir accès à la cavité buccale. Ces mauvaises habitudes de travail, ainsi que des tâches répétitives comme le détartrage des dents et le curetage du cément radiculaire, contribuent grandement à entraîner des désordres musculo-squelettiques, des demandes d'indemnité pour cause de stress et des pertes de productivité.

Pour les cliniciens, le principal objectif est de trouver une position qui leur permette d'avoir le meilleur accès possible à la cavité buccale, de bien la voir, d'être confortables et de posséder une pleine maîtrise en tout temps. Avec l'objectif de la profession qui est d'administrer des soins de la meilleure qualité possible en vue d'obtenir un profit raisonnable, la pratique de l'ergonomie devient un but principal à viser pour déterminer comment un cabinet atteindra le succès avec moins de stress.

Introduction

Ergonomics, the science that studies human stress and strain as they relate to activity, will take on new emphasis this year in the United States. While the term has been accepted by consumers as a benefit-added feature of a given product, it will soon be a required feature in the workplace.

By court order, the state of California will be the first to finalize an ergonomic standard. And, provided the budgets of fearful busi-

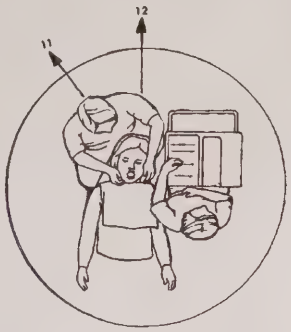

Fig. 1: A right-handed dentist should be seated between 10:30 and 11:00, with the patient reclined into a supine position.

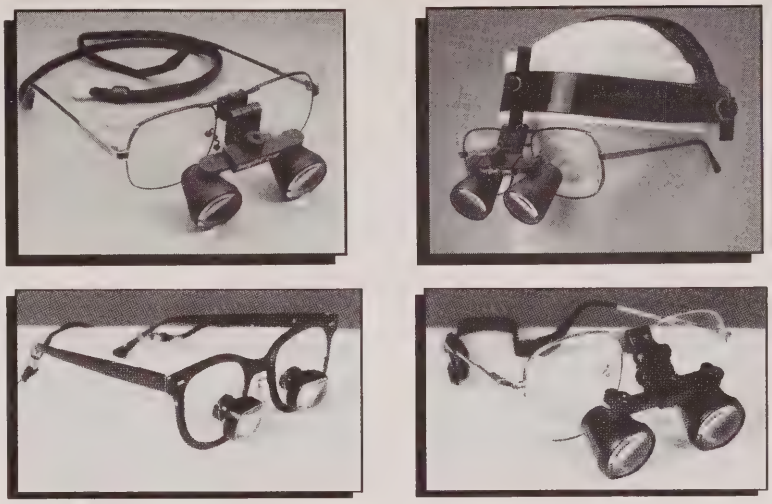

Fig. 2: Dental scopes allow greater visibility with no musculoskeletal risks. (Courtesy of SurgiTel, Design for Vision and Dimension Three.)

ness owners and Congress don't force the wind in an opposite direction, the Federal Occupational Safety and Health Administration (OSHA) will also continue in its effort to finalize draft regulations.

The cost of compliance with the new standards has worried large businesses, and these same businesses continue to scrutinize ergonomic concepts for lack of scientific evidence. Nonetheless, smart business owners who choose to provide their workers with a safe work environment will "buy in" to ergonomics and realize many hidden rewards.

Objectives

The primary objective of ergonomics is to prevent work-related musculoskeletal disorders, signs or symptoms caused or aggravated by work-related tasks (e.g. tendinitis, lower back pain and carpal tunnel syndrome). Prevention is achieved through controlled exposure to the workplace risk factors that cause or aggravate these disorders. The National Institute for Occupational Safety and Health (NIOSH), claims that some workplace tasks can cause or aggravate more than 160 musculoskeletal and nervous system disorders ranging from back pain, to joint pain, to neck pain, to tendinitis.[1]

Currently, OSHA's draft regulations require employers to evaluate technology for risk factors and promote continuous improvement. Risk factors can be reduced by controlling tasks that over-stress the worker, such as repetitive motion activities, fixed or awkward work postures, forceful hand exertions, and tasks that require the worker to use vibrating or impacting tools. According to OSHA, when these activities are required in a specific job, the job is considered a "problem job" until the tasks are modified to no longer cause or aggravate musculoskeletal disorders.

In dentistry, we often observe habits that could fall into one of these risk factor categories. In most cases, we find that dental providers adapt whatever position is necessary to access the oral cavity. While these chairside gymnastics do not support sensible work habits, or the team's overall efficiency, negative effects continue to go unnoticed.

I believe that dentists see these awkward positions as nothing more than an unavoidable necessity associated with the practice of dentistry. It has become my mission, therefore, to help dental professionals realize the benefits of ergonomics, by helping them to replace abusive habits with "human factor" work modes and "user-friendly" work environments.

Dento-Ergonomics

With the professional goal to deliver the highest quality of care in less time and with less stress, ergonomics becomes a core focus of how patient care is provided.

The key objective for the clinician is to adopt a position that allows him or her to achieve optimum access, visibility, comfort and control at all times. Ideally, when providing patient care, all muscles should be in a relaxed and well balanced position, with the exception of those muscles performing the task. This goal is often violated because of poor visibility. When visibility is blocked, posture is compromised by leaning, twisting or otherwise taking on awkward postures.

Basic orthopedic and physiological conditions suggest that the dental assistant should be positioned parallel to the patient, with the left hip aligned adjacent to the patient's left shoulder. The work surface containing the instruments and materials to be used during the procedure should be positioned directly over the assistant's lap to minimize motion and enhance access.[2]

At Teamwork Concepts, we have found that a team's performance level depends, to a large extent, on the assistant's ability to see. More than 99 per cent of the time we find that the manner in which the dentist positions his or her fingers on the mirror handle can obstruct the assistant's visual access. To ensure that the hand holding the mirror does not block the assistant's view, position the fingers holding the mirror away from the left corner of the patient's mouth (when working with a right-handed operator). This will require a soft exterior fulcrum, rather than the more commonly used hard-surface, intraoral fulcrum. When the assistant has a clear view, his or her skills are enhanced dramatically. In addition, since the assistant will not have to strain to see the treatment site, musculoskeletal disorders are reduced.

Ideal team positioning suggests that a right-handed dentist should be seated between 10:30 and 11:00 (**Fig. 1**),[3] with the patient reclined into a supine position, and the assistant's left hip parallel to the patient's left shoulder.

Both the dentist's and assistant's chair should provide maximum lumbar support. The assistant should be seated about four to six inches higher than the dentist's eye level with a foot rest to support his or her feet. This elevated position allows the assistant to see over the dentist's hands while assisting him or her.

Rather than adjusting the dentist's position, the patient's head should be adjusted whenever possible. Neck pillows should be placed under the patient's neck to facilitate an upward chin position. The patient should also be instructed to rest his or her teeth on a bite block to stabilize the jaw during procedures. This will save a significant amount of time by eliminating the need to stop the procedure and ask the patient to keep his or her mouth open. Additionally, the tissue can be managed more effectively with rubber dam isolation.

While posture and positioning are key factors in the application of ergonomic principles, dental equipment and cabinetry fixtures may also require alterations to achieve an ergonomically correct practice. Equipment should not prevent the dental team from obtaining ideal working positions. The design of the treatment area, and/or the equipment used, must not hinder team efficiency. Team members should assess their equipment, and the office floor plan, to determine whether any features are obstructing ideal function, and then correct as many as possible. For example, if the equipment or cabinetry is beyond a reasonable reaching distance (about 20") from the working dental team, adjustments must be made to minimize motion and awkward postures.[4]

Field Magnification

No dentist would deny that he or she would like to get closer to the treatment site while treating patients. And, while most individuals do so by bending at the waist and neck, dental scopes can facilitate this goal without the associated musculoskeletal risks. While the use of magnification (**Fig. 2**) is not necessarily required to achieve ideal postures, a magnified field can discourage the dentist from leaning forward in order to get closer to the area being treated.

Surgical magnification is common practice in the medical profession. You can't watch a television show or movie these days without seeing telescopic loupes on the actors involved in surgery. Although dental professionals have been a bit slower to adapt magnification into their practices, there has been a significant increase in use within the last three years — primarily because of an increased awareness of magnification benefits, which include increased quality care, procedure time savings, and several human factor improvements resulting from ideal working postures. Improved working distances (the distance from the eye to the viewed object), fields of view (size or angular extent of an object being viewed) and viewing angles (the angle of the oculars, which allow the operator to bend less at the neck), have all contributed to the increased acceptance and use of telescopic loupes.

I believe that dental schools should require students to use magnifiers and encourage them to develop good postural habits, while reaching quality care goals that would not otherwise be actualized. A recent study performed at the University of the Pacific shows that student errors decreased by 50 per cent when magnification was used.[5] These results prove that performance can be improved with better vision, and that the use of magnification reduces error when preparing teeth, or doing laboratory procedures for fixed prostheses.

With this in mind, I maintain that dentistry should not be performed without the use of magnification. There is no question in my mind that both the quality of work and the postural benefits that result from the use of magnification are unparalleled. Magnification should, therefore, be considered essential for the dentist and a wise decision for the hygienist.

Conclusion

Regardless of the ergonomic issues being evaluated or modified, each practice should involve the entire dental team in the evaluation process to ensure total team participation. What may work for one individual may not work as well for another. The most ideal conclusions will be made when the majority of the group feels that their needs are being met.

Dento-ergonomics can have a very positive effect on the way you practise dentistry. Smart practices will integrate ergonomic principles into their daily routine as a means of providing a higher quality of care, in less time, and with less stress.

With managed care and infection control compliance continuing to threaten dentistry's bottom line, the success of a practice can no longer be predicted by a dentist's ability to "drill, fill and bill." Smart practices realize their success depends on the team's ability to work together efficiently. Considering teamwork is essential in the "goal oriented" formula, the coordination of behaviors is interdependent upon achieving this task. ■

Risa Pollack is a certified management consultant, certified and registered dental assistant, and nationally known speaker. She is the founder and president of Teamwork Concepts, a management consulting firm based just outside San Francisco, California. She is also editor of ADA's publication *Dental Teamwork*, and consultant to ADA's Council on Dental Practice.

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AUGUST 17 - 20 • **Montréal 1996** • DU 17 AU 20 AOÛT

CANADIAN DENTAL ASSOCIATION CONVENTION / CONGRÈS DE L'ASSOCIATION DENTAIRE CANADIENNE

The CDA 1996 Convention:

New Format, New Programs, New Attractions

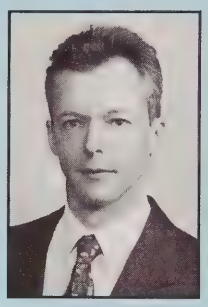
Dr. Michel Jahjah

Dr. Micheline Blain

Dr. Sylvain Gagnon

Dr. Sylvain Laforte

Dr. Sam Sgro


Dr. Joseph Szwimer

As soon as we started planning this year's Convention, we were determined to offer Canadian dentists something fresh, something different. So, the very first thing that we looked at was the lecture format. Since the theme that we adopted for the meeting is "Together in 1996", we felt it appropriate to encourage exhibitors and participants to "get together" in a relaxed atmosphere away from the formal exhibit booth. For this reason, participants and exhibitors are invited for **coffee, muffins & music**, Monday and Tuesday mornings at 7:30 in the Exhibit Hall.

Following this light breakfast and again at 1:15 in the afternoon, a **Keynote Session** will take place. These four keynote lectures will center on nutrition, a much researched and talked-about topic in the 1990's. Speakers during these sessions will be Mr. Robert Pritikin, Dr. Michael Jacobson, Dr. Joseph Schwarcz and Ms. Louise Lambert-Lagacé, all very high-calibre and highly reputed lecturers.

Although we have kept the traditional format of two pre-convention days during which hands-on workshops and limited attendance lectures take place, we have redesigned the format of the Convention proper. Throughout the day, several one and a half hour lectures are scheduled along with the more conventional half-day presentations. This will allow participants a wider choice of subjects, over 60 lecturers will be offered, and greater flexibility to visit the Exhibit Hall.

Cognizant that specific challenges face those who are starting in the profession, we have developed a **Young Dentist Program**. The full-day of activities have been elaborated in cooperation with the CDA New Dentist Committee, headed by Toronto dentist, Dr. Jocelyn Pearce. Several top-notch speakers and clinicians have been invited to address participants in this program, especially designed for those who graduated between 1986 and 1996. The Young Dentist Program is scheduled for Monday, August 19th.

A further novelty of this year's Convention is the **Center for Business Opportunities**. We know that several dentists are looking to sell their practices, form an associateship or hire another dentist to work with them. On the other side of the coin, there are those who are ready to buy a practice and those seeking career opportunities, whether in an associateship or through employment. Our aim, therefore, is to provide an occasion where interested parties can meet. Our Convention staff is ready to accept postings for the Center and we will do our best to set the wheels in motion and facilitate business exchanges.

In the last few months, CDA has jumped on the bandwagon and will join the hundreds of thousands who have a web page on the **Internet**. We know how intimidating the prospect of "surfing the Net" can be for those who have never had the experience. We also know how frustrating it can be for those who are starting out without direction. We have therefore endeavoured to assist those who are interested with their entry into the sphere of the World Wide Web. Facilitators will give lectures during the Convention and an Internet area has been designed in the ODQ/QDSA/CDA booths in the Exhibit Hall.

Finally, our social program has also benefitted from our new approach. The Sunday evening **Opening Ceremony** will, as in the past, have its entertainment section, however, we wanted you to leave the place with something to take home. For this reason, we have invited the author of *The Wealthy Barber*, David Chilton to come and share some personal money management and financial planning hints with the audience. The 1996 Opening Ceremony will certainly be an event you'll not want to miss.

We are still putting the finishing touches to some of the Convention activities, and we are convinced that 1996 will be an unprecedented meeting.

See you in Montréal this August,

The members of the 1996 Organizing Committee

SPECIAL EVENTS AND SPONSORS

$100,000 GOLF Tournament

One lucky golfer may leave the **1996 CDA-Aurum Ceramic/Classic Golf Tournament** $100,000 richer! The golf day is scheduled for Sunday, August 18 at the Terrebonne Golf Club with a shotgun start set for 9:00 am.

During regular play, a select number of participants who are "closest to the hole" at a designated hole will have a chance to compete for the $100,000 hole-in-one contest at the end of the day.

In addition, CDA is donating $20 of each entry fee to the Juvenile Diabetes Foundation. What a great way to contribute to a worthy cause and have fun at the same time!

On Your Mark, Get Set, Go!

The CDA 1996 Annual Fun Run and Walk will send you on your way to discover the beauty of Mount-Royal Park. A 5 and 10 kilometre course through Montréal's most loved green space is planned for Tuesday, August 20 at 7:30 am. Enjoy a great run or brisk walk at the start of your day as you make your way around Beaver Lake and across other great scenic pathways.

Running/walking time will be recorded and prizes will be awarded. Each participant will receive a 1996 Convention t-shirt and refreshments will be available.

To register for either the Golf Tournament or the Fun Run & Walk call CDA Conventions at 1-800-267-6354 or select the appropriate section of the enrolment form and send in the required fees.

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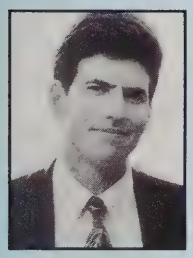
KEYNOTE SESSIONS

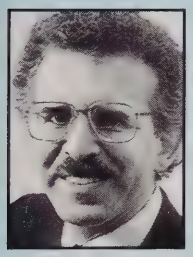
NUTRITION AND THE EXPERTS

What is the difference between good and bad cholesterol and when should you be concerned about it? Should you be cutting fat and calories from your diet or should you just be more active? Can you trust the information found on labels, how can you tell if it is misleading? How concerned should you be about additives to food products and how do you measure their harmfulness?

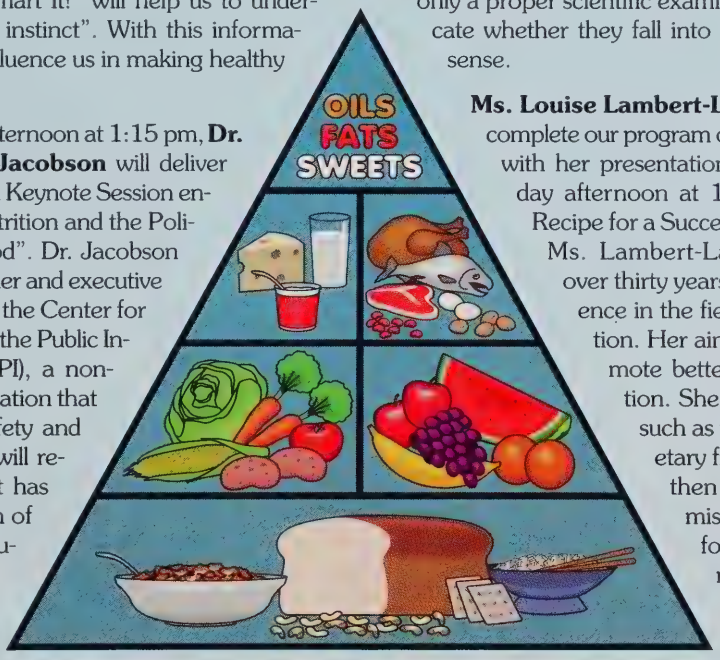
The new Keynote Session program at the Canadian Dental Association's 1996 Convention focuses on the hot topic of nutrition and will answer questions such as those listed above. Leading experts from Canada and the USA will dispell the misconceptions and weed through the abundance of information found in the health market today.



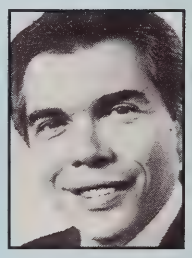
The Keynote Sessions begin on Monday morning at 8:15 am with the Murray McDonald lecture given by **Robert Pritikin**. Mr. Pritikin is Director of the Pritikin Longevity Centers in Santa Monica, CA and Miami Beach, FL. His medically supervised programs at the centres are designed to give a broader understanding of nutrition, exercise and stress management, and to provide the knowledge, skills and support to maintain successful lifestyle habits. His presentation entitled, "The Fat Instinct: How You Can Outsmart It!" will help us to understand what is in fact the "fat instinct". With this information, the lecturer aspires to influence us in making healthy lifestyle choices.



Monday afternoon at 1:15 pm, **Dr. Michael Jacobson** will deliver the second Keynote Session entitled, "Nutrition and the Politics of Food". Dr. Jacobson is co-founder and executive director of the Center for Science in the Public Interest (CSPI), a non-profit health-advocacy organization that focuses on nutrition, food safety and alcohol policy. Dr. Jacobson will reveal the role the government has played in regards to the health of individuals and the kind of influence it has or can have over manufacturers, restaurants and food distributors.



Tuesday's Keynote Sessions begin at 8:15 am with **Dr. Joseph Schwarcz**. This speaker will share a truly scientific perspective on nutrition and health with his lecture entitled, "Sense, Nonsense & Science". There is much confusion in the information given to the general public about enzymes in food, using dietary supplements to cure diseases, dioxins in toilet paper, mercury in our fillings, radon in the basement, aluminum in antiperspirants and lead in dinnerware. Dr. Schwarcz teaches that only a proper scientific examination of these issues can indicate whether they fall into his category of sense or nonsense.

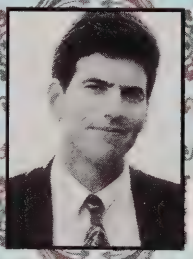


Ms. Louise Lambert-Lagacé will complete our program on nutrition with her presentation on Tuesday afternoon at 1:15, "The Recipe for a Successful Diet". Ms. Lambert-Lagacé has over thirty years of experience in the field of nutrition. Her aim is to promote better health through better nutrition. She will discuss and explain terms such as fat counts, antioxidants and dietary fibres. Ms. Lambert-Lagacé will then pinpoint our most common mistakes and provide specific information on how to select the right foods when we have so many choices before us.

These Keynote Sessions will be a practical and eye-opening examination of the influence that nutrition has on the quality of our everyday lives. We will also be better equipped to understand just what is true and false concerning nutrition.

YOUNG DENTIST PROGRAM

Leading experts will participate in the newly developed Young Dentist Program



Robert Pritikin

Dr. Paul Bass

Peter Volpé

Jeff Wollborn

The Young Dentist Program offers those who graduated between 1986-1996, a full day of lectures geared to meet their special needs. On Monday, August 19th, starting with coffee, muffins and music at 7:30 a.m. in the Exhibit Hall, the morning will begin with a presentation on the subject of nutrition by **Robert Pritikin**. Son of the late Nathan Pritikin, under whose direction he conducted and co-authored the first clinical trial of the Pritikin Program, Mr. Pritikin is director of the Pritikin Longevity Centers in Santa Monica and Miami Beach. He has authored numerous books and has been featured on "Nightline" and the "Today Show". He is quoted regularly in publications such as the *Wall Street Journal* and the *New York Times*.

Following this Keynote presentation, participants are invited to a series of three lectures on Practice and Financial Management and Insurance. **Dr. Paul Bass** will lead the way with a lecture entitled "The 1990's: A Great Time to Start a Practice". Dr. Bass has presented over 2,000 seminars, workshops and training programs spanning a period of ten years, positively impacting tens of thousands of people with his work.

Then, the Canadian Dental Service Plans Inc. (CDSPI) will present two high-calibre speakers. **Peter Volpé** is a chartered and Registered Financial Planner involved in advising corporate executives, professionals and high net worth individuals on personal financial management. His lecture on "Building Your Financial Success — Starting Now" is sure to be filled with extremely valuable tips. Mr. Volpé will be followed by **Jeff Wollborn**, an authority in the fields of insurance, investment and financial planning. Mr. Wollborn will discuss "Insurance Protection for Financial Well-Being".

The afternoon will also consist of a series of three lectures howbeit on clinical subjects. **Dr. Mike Suzuki** is a speaker who has numerous publications in the area of Biomaterials Science and who has lectured extensively around the world, will give a short presentation on "Aesthetic Posterior Restorations". **Dr. Harry Rosen**. He will continue with a very timely lecture on "Aging Periodontal Prosthodontic Patients", endeavouring to demonstrate how grateful patients become excellent practice builders. **Dr. Perry Goldberg** and **Dr. Marvin Werbitt** will conclude the afternoon session. These two clinicians, who have lectured in Japan, Europe and throughout North America, will address the subject of "Osseointegration — Its Uses and Abuses".

All the participants attending the Young Dentist Program will be invited to lunch and afternoon cocktails. If you have graduated between 1986 and 1996, be sure to register for this stimulating program. See your Preliminary Program for more details.

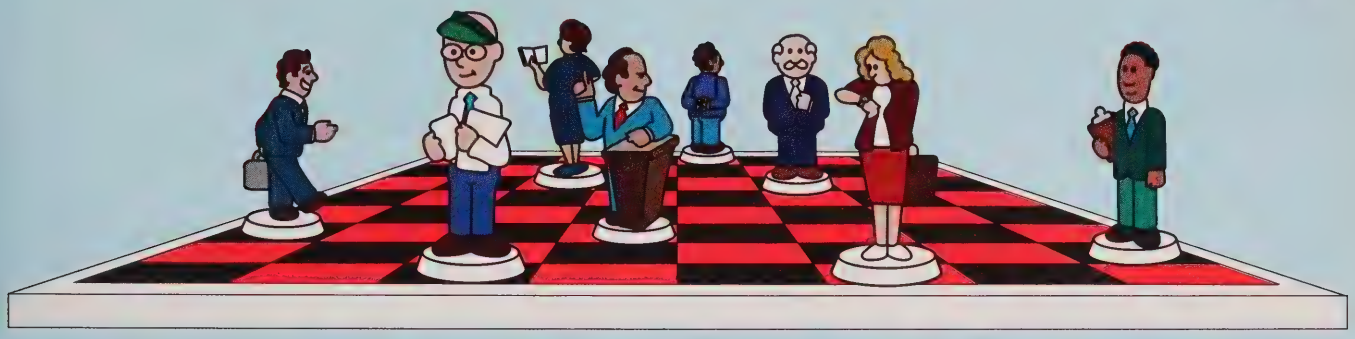
Dr. Mike Suzuki

Dr. Harry Rosen

Dr. Perry Goldberg

Dr. Marvin Werbitt

BUSINESS OPPORTUNITIES



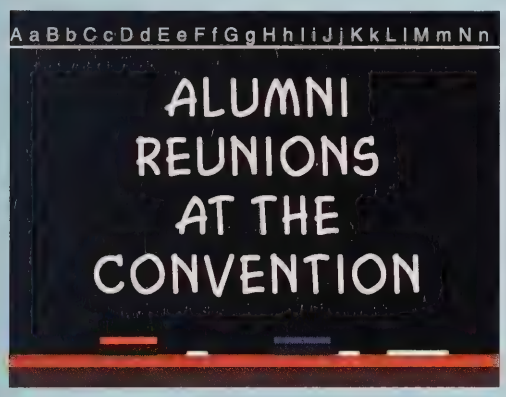
CENTRE FOR BUSINESS OPPORTUNITIES

The Centre for Business Opportunities, a new feature of the CDA Convention, will be in full operation for registered dentists during the 1996 meeting. An area will be set up at Place Bonaventure to facilitate meetings between those with matching business interests. Strict confidentiality is insured as only Convention staff will be aware of your identity.

If, as a dentist, you want to sell or buy a practice, form an associateship, are seeking employment or wish to hire another dentist, take advantage of the unique opportunity afforded by the Convention.

Forward the details of what you wish to offer or of what you are seeking, in writing to the CDA Convention department (please mail or fax at (613) 523-3062). Your request will then be posted during the Convention under a given number. When someone expresses interest in your business opportunity, Convention staff will set up the meeting.

We are now ready to receive your requests! Contact Laura Stephenson at 1-800-267-6354 for further information.



Receptions are planned for the alumni of the Faculty of Dentistry of McGill and Dalhousie Universities.

On Saturday, August 17th, 5:00 - 7:00 pm in Le Portage of the Montréal Bonaventure Hilton, a cocktail reception will be held for McGill University's Faculty of Dentistry alumni/ae. Graduates and spouses are welcome.

On Sunday, August 18th, 3:30 - 4:45 pm, again in Le Portage of the Montréal Bonaventure Hilton, the Faculty of Dentistry at Dalhousie will hold a reception for its dentistry and dental hygiene alumni.

For more information call:
Ms. Debbie Larocque, McGill University (514) 398-7203 ext. 4165
Ms. Marg Redden, Dalhousie University (902) 494-7139

SURFING IN MONTRÉAL?

For most people, the expression "surfing" has lost its connotation of waves, sand and holidays. The term has rather become synonymous with sitting in front of a computer, searching through a maze of data for some tidbit of information that could be useful. Yes, we can read the entire works of William Shakespeare on the Net, but so what?

It is with this reality in mind, that sessions on the Internet have been devised for the Convention. Our facilitators will introduce you to the world of the Internet and help you "navigate" your way to useful information. They will guide you in your search of a "server", give you tips on sending and receiving e-mail and demonstrate how you can use the Internet in your daily practice by accessing CDA's home page.

To further help you "surf the Net", an area will be set up in the ODQ/QDSA/CDA booth where, at your leisure, you can get some hands-on experience.

So... come to Montréal and be prepared to surf!

SCIENTIFIC PROGRAM

HANDS-ON WORKSHOPS & LIMITED ATTENDANCE LECTURES

Several specialists have been invited to participate in the pre-Convention segment of this year's meeting. During hands-on workshops and limited attendance lectures, experts in their field share their knowledge and reduced classroom size affords participants an optimum learning environment. Drs. Herbert Bader, Pierre Boudrias, Gary Glassman, Kenneth Serota and Ms. Jane Jones will demonstrate, through a hands-on approach, techniques in Periodontics, Implants and Endodontics. Drs. William Blatchford, David Hornbrook, and Louis Touyz will lecture on Practice Management, Aesthetics and Adhesion and Periodontics. Consult the Preliminary Program for more information and register today. Space is limited.

HANDS-ON WORKSHOPS

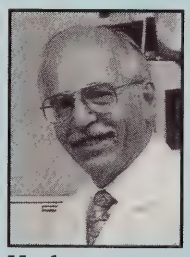
Saturday, August 17 & Sunday, August 18

Pierre Boudrias, D.M.D., M.S.D.
Montréal, QC

Implants: Basic Prosthetic Certification Course

This two-day certification course has been specifically designed to provide participants with a study of implant supported restorations ad modum Branemark. Steps to achieve success will be reviewed: from patient selection & treatment planning to description of treatment procedures.

Sunday, August 18

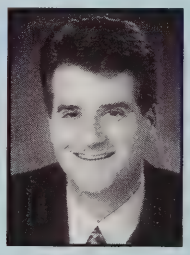


Herbert Bader, D.D.S. & **Jane Jones, R.D.H.**
Boston, MA — *Lake Worth, FL*

Scaling and Root Planing

This course reviews the most current concepts and techniques for hand and powered instrumentation. Participants will be able to compare, evaluate and practice with the latest piezoelectric instrumentation or a typodont.

Sunday, August 18



Gary Glassman, D.D.S. & **Kenneth Serota, D.D.S., M.M.Sc.**
Toronto, ON — *Toronto, ON*

Endodontic Impressionism: A Palette for Excellence

This course addresses the concepts and details the skills necessary for acquiring the expertise to perform the highest calibre endodontics.

LIMITED ATTENDANCE LECTURES

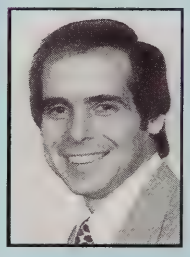
Saturday, August 17

David S. Hornbrook, D.D.S.
La Mesa, CA

Mastering Aesthetics and Adhesion — Dental Care for the 21st Century

This course is designed to maximize your learning experience and benefit your patients by introducing and expounding on ideas that can be used immediately and reliably in your own office. Renew your passion for dentistry and discover the creative and artistic side of dentistry.

Saturday, August 17



Louis Touyz, B.D.S., M.Sc., M.Dent
Montréal, QC

A New Look at Periodontics in the Nineties

The discussion will reveal that all periodontal diseases are not the same and that diagnosis in the nineties demands a focussed clinical classification. Subjects covered are initial assessment, ranking or treatment, review of malodor, dental sensitivity, surgery for elective clinical crown lengthening or single rooted teeth.

Sunday, August 18

William Blatchford, D.D.S.
Sunriver, OR

Presenting Ideal Treatment and Getting a Yes!

The lecturer will present the skills necessary for the survival of your practice in a non-insurance environment. Dentists will learn what patients want and how they can provide it. They will also learn how to have patients accept their best treatment not just what insurance pays.

The 1996 Scientific Program: Over 60 good reasons to attend the Convention

From Saturday, August 17 through Tuesday, August 20, participants can choose from over 60 lectures on a wide range of subjects of interest to the entire dental team. With the format such as it is, one can attend up to six different lectures a day! For your convenience, we have grouped lectures according to their relevant areas in dentistry. The following list will help you in planning your day during the Convention.

Adhesive Dentistry
- Mastering Aesthetics and Adhesion – Dental Care for the 21st Century — David S. Hornbrook, D.D.S.

Endodontics
- Endodontic Impressionism: A Palette for Excellence
- Endodontics Redux: The Paradox Principles — Gary Glassman, D.D.S. / Kenneth Serota, D.D.S., M.M.Sc.
- Pain Control and Endodontic Emergencies — Léon Lemian, D.D.S., M.Sc.D.

Geriatric Dentistry
- Aging Periodontal Prosthodontic Patients – Problem Solving and Practice Building — Harry Rosen, D.D.S.
- Management of Elderly Patients in the Private Dental Office
- Issues and Problems of Caring for Dental Patients in the Long Term Care Setting — Ronald L. Ettinger, D.D.S.

General Interest
- Science – It's More Than Just Puffs and Bangs! — Joseph Schwarcz, Ph.D.

Histology
- Short Review of Dentin and Pulp Issues – From a Histological, Physiological and Clinical Perspective
- Pulp Fiction: Myth & Misconceptions — Charles F. Cox, D.M.D.

Implants
- Implants: Basic Prosthetic Certification Course — Pierre Boudrias, D.M.D., M.S.D.
- Incorporating Osseointegrated Implants in a Restorative Dental Practice — Michael J. Engelman, D.D.S.
- Osseointegration: Its Uses and Abuses — Perry V. Goldberg, D.D.S., M.S.D. / Marvin J. Werbitt, D.D.S., M.Sc.D.
- Problems and Solutions to Implantology — Jacinthe Larivée, D.D.S.

Infection Control
- Disinfection – Sterilization: Let's Be Rational — René Guy Landry, D.M.D., Dip. Perio, M.Sc.
- Infection Control: What You Don't Know Will Hurt You!
- Infection Control Into the Next Century — Trey L. Petty, D.D.S.
- Glove Usage: Can One of Your Best Sources of Protection Be a Potential Risk? — Wava M. Truscott, Ph.D.

Internet
- Introduction to the Net — Michel Descharmes

Nutrition
- The Fat Instinct: How You Can Outsmart It! — Robert Pritikin
- Nutrition and the Politics of Food — Michael Jacobson, Ph.D.
- Sense, Nonsense & Science — Joseph Schwarcz, Ph.D.
- The Recipe for a Successful Diet — Louise Lambert-Lagacé, B.Sc. (Nutrition)

Oral Medicine / Oral Pathology
- Common Oral Lesions of Interest to the Dental Team
- Emergencies in the Dental Office — Alan J. Drinnan, D.D.S., M.D.
- Pre-Malignant and Malignant Lesions of the Oral Cavity — Rénald Pérusse, D.M.D., M.D.

Oral Surgery
- Sinus Complications — Huan Pham, D.D.S.

Orthodontics
- Guiding the Developing Dentition — Jon T. Kapala, D.M.D., M.Sc.D.
- Dentistry / TMD: Past, Present and Future — Harold T. Perry, D.D.S., M.S.D., Ph.D.
- Interceptive Orthodontics in Mixed Dentition — Daniel Tanguay, D.M.D., M.S.

Pedodontics
- Aesthetics and Function in Pedodontics — Patrick Canonne, D.D.S.
- Managing Traumatic Injuries in the Primary & Immature Permanent Dentitions — Jon T. Kapala, D.M.D., M.Sc.D.

Periodontics
- Scaling & Root Planing
- New Perspective in Soft Tissue Management — Herbert I. Bader, D.D.S. / Jane Jones, R.D.H.
- A New Look at Periodontics in the Nineties
- Dentinal Sensitivity — Louis Touyz, B.D.S., M.Sc.(Dent), M.Dent (Pom)
- The Probe Examination: The Essence of Screening, Diagnosis and Periodontal Treatment — Michel Couture, D.M.D., Dip. Perio.
- Periodontal Surgical Procedures – What They Are All About and When to Do Them
- Periodontal Treatment in a General Practice – What to Do and What Not to Do — Cary A. Shapoff, D.D.S.

Pharmacology
- Pharmacology of Pain Control: Local Aneasthetics and Vasoconstrictors
- Pharmacology of Pain Control: Analgesics — Daniel Haas, D.D.S., Ph.D.

Practice Management
- Effective Communication with Staff and Clients in the Dental Environment
- The Balancing Act – Managing Stress Creatively — Marion Balla, M.Ed., M.S.W., C.S.W.
- The 1990's: A Great Time to Start a Practice
- Practice Management for the Next Millenium — Paul Bass, D.D.S.
- Presenting Ideal Treatment and Getting a Yes! — William Blatchford, D.D.S.
- Financial Planning for the Dental Staff: Creating Financial Wealth
- Running a Successful Practice: Let's Make it Fun and Profitable! — Gisèle Bourgeois, B.A.
- The Patient-Driven Practice — Derek Hill, CA
- The Power of Effective Communication — Mary Ann Kindy
- Things That Make a Difference in the Success of Your Practice — Don McCallum
- Tax Loopholes: What You Can't Do, What You Shouldn't Do and What You Can't Afford Not to Do
- Using Tax Savings to Secure Your Retirement — Thomas Olson, J.D., LL.M (Taxation)
- Practical Financial Management for New Dentists — Peter Volpé
- Insurance Protection for Financial Well-Being — Jeff Wollborn

Prevention
- Overview of New Toothbrush Research — Samuel L. Yankell, Ph.D., R.D.H.

Prosthodontics
- Refined Tooth Preparation for Restorative Procedures
- Did You Get It? Final Impressions — Brian Kucey, D.D.S., M.S.Ed
- The Removable Partial Denture – Basic and Advanced Design & Techniques— Gilles Gauthier, D.M.D., M.S.E.
- Oral Appliances for the Treatment of Snoring and/ or Obstructive Sleep Apnea — Alan A. Lowe, D.M.D., Dip. Ortho., Ph.D.
- Diagnosis and Treatment Planning of Difficult Denture Patients – How to Make Dentures Fun
- Including the Neutral Zone with Today's Technology in our Delivery of Full Dentures — Joseph Massad, D.D.S.
- Selecting the Appropriate Anterior Crown and Tooth-Coloured Inlay/Onlay — John Nasedkin, D.D.S.

Radiology
- What Patients Want to Know

Restorative
- Aesthetic Resin Bonded Restorations and Clinical Limitations
- Aesthetic Posterior Restorations — Mike Suzuki, D.D.S., M.S., D.M.D.
- Restorations of Endodontically Treated Teeth — Pierre MacKay, D.D.S.
- Aesthetics and Function – Integrating Aesthetics and Occlusion/tm Joint with Ceramic and Adhesive Concepts — John Nasedkin, D.D.S.
- Why Use Rubber Dams? — Denis Robert, D.M.D., M.Sc.D.
- Surgical Dentistry – Using the Abrasive Jet — Robert Séguin, D.D.S.

For a detailed description of these lectures, consult the Preliminary Program.

AUGUST 17 - 20 • **Montréal 1996** • DU 17 AU 20 AOÛT

CANADIAN DENTAL ASSOCIATION CONVENTION / CONGRÈS DE L'ASSOCIATION DENTAIRE CANADIENNE

ONE FORM PER PERSON

PRE-REGISTRATION & HOTEL RESERVATION FORM • Please PRINT

1. Use **1 FORM FOR EACH INDIVIDUAL** you would like to register. You may photocopy the enrolment form, or you can obtain additional forms by contacting CDA Conventions at 1-800-267-6354.
2. **EACH** individual's name should be printed clearly in the appropriate section. **EACH** individual form should select a **DELEGATE TYPE** in order to register for the Convention.

Check one: ☐ Dr. ☐ Mr. ☐ Ms.	Family Name		
	First Name		Sex: ☐ M ☐ F
Street address			
City	Province	Postal Code	
Office Telephone ( )		Home Telephone ( )	
Fax ( )		CDA Membership Number	

LIMITED ATTENDANCE COURSES

Saturday, August 17th —

David S. Hornbrook — Mastering Aesthetics and Adhesion: Dental Care for the 21st Century — All day lecture
Dentist ..... $135 _____
Dental Staff (non-dentist) ..... $ 65 _____

Louis Touyz — A New Look at Periodontics in the Nineties — All day lecture
Dentist ..... $135 _____
Dental Hygienist ..... $ 65 _____

Sunday, August 18th —

William Blatchford — Presenting Ideal Treatment and Getting a Yes! — All day lecture
Dentist ..... (7% GST included) $135 _____
Dental Staff (non-dentist) ..... (7% GST included) $ 65 _____

GST is included in the Limited Attendance Practice Management courses. GST is not charged on Limited Attendance and Hands-on scientific courses.

Lunch is included in all day Limited Attendance and Hands-on courses.

***NOTE:** Every dentist enrolled for the Convention can register two (2) non-dentist staff members for the convention proper FREE OF CHARGE. The first or second non-dentist staff member to register *with* a dentist, choose "Registration Fees" Nil. Send Registration Form with that of the dentist.

HANDS-ON WORKSHOPS

Saturday, August 17th & Sunday, August 18th —

Pierre Boudrias — Implants: Basic Prosthetic Certification Course — Two day hands-on workshop
Dentist (limited to 50 participants) ..... $295 _____

Sunday, August 18th —

Herbert I. Bader & Jane Jones — Scaling and Root Planing — Half day hands-on workshop
Dentist/Dental Hygienist (limited to 40 participants) .. $ 115 _____

Gary Glassman & Kenneth Serota — Endodontic Impressionism: A Palette for Excellence — All day hands-on workshop
Dentist (limited to 40 participants) ..... $ 195 _____

CONVENTION

Choose only one delegate type. 1 registrant per form.

☐ **Dentist**
Member of CDA ..... $ Nil _____
Non-member of CDA ..... (7% GST included) $175 _____
☐ I will attend the Young Dentist Program (Graduate 1986-96) ..... $ Nil _____
My year of Graduation _____

☐ **Spouse** ..... (7% GST included) $ 98 _____

☐ **Dental Hygienist** ..... (7% GST included) $ 98 _____
Dental Hygienist (See note below)* ..... $ Nil _____

☐ **Dental Assistant** ..... (7% GST included) $ 98 _____
Dental Assistant (See note below)* ..... $ Nil _____

☐ **Office Personnel, Office Manager, Receptionist** ..... (7% GST included) $ 98 _____
Office Personnel, Office Manager, Receptionist (See note below)* ..... $ Nil _____

☐ **Dental Technician** ..... (7% GST included) $ 98 _____

☐ **Student Dentist** ..... $ Nil _____
☐ **Student Dental Hygienist** ..... $ Nil _____
☐ **Student Dental Assistant** ..... $ Nil _____

* Students must provide proof of full-time attendance.

Are you the person or one of the persons responsible for purchases in the office? ☐ **Yes**

GST Registration Number: R106845209

SOCIAL EVENTS

☐ **Opening Ceremony** — Sunday, August 18th
(Subject to space availability — One ticket per Registration Form)
Will attend ☐ Yes ☐ No ..... $ Nil _____

☐ **Meet & Greet** — Sunday, August 18th
..... (7% GST included) $ 55 _____

☐ **President's Gala** — Dinner Cruise — Monday, August 19th
..... (7% GST included) $ 75 _____

☐ **Golf Day** — Sunday, August 18th
..... (7% GST included) $125 _____

☐ **Fun Run** — Tuesday, August 20th a.m.
..... (7% GST included) $ 25 _____

☐ **Visits and Tours** (See page 14 for details)
City Tour — August 17 ..... (7% GST included) $ 50 _____
Old Montréal — August 18 ..... (7% GST included) $ 50 _____
Knowlton — August 19 ..... (7% GST included) $ 50 _____
Shopping — August 20 ..... (7% GST included) $ 50 _____

☐ **Children (6-12 years)** Child's Age: _____
Sunday program ..... (7% GST included) $ 48 _____
Monday program ..... (7% GST included) $ 48 _____
Tuesday program ..... (7% GST included) $ 48 _____

TOTAL (ALL sections) ..... $ _____

Person/company
responsible for payment: _____

☐ I wish to pay the above total by credit card:

☐ MasterCard ☐ VISA

Card # _____

Expiry Date _____

Name of Cardholder _____

SIGNATURE _____

☐ I enclose a cheque payable to the Canadian Dental Association.
Post-dated cheques will not be accepted.

CANCELLATION POLICY:

- Cancellation received, in writing, on or before July 26, 1996 — full refund
- Cancellation received, in writing, after July 26, 1996 — subject to a 25% administrative charge

NO REFUND AFTER AUGUST 10, 1996

☞ INFORMATION ON REGISTRATION:

All participants registered for the Convention:

- have access to all general lectures of the Convention proper
- have access to the exhibit hall
- have access to the Opening Ceremony
- are entitled to register for the appropriate limited attendance lectures and hands-on courses
- are entitled to register for social events, visits and tours

Spouses and children have access to the Opening Ceremony only if they register for one or more of the Convention's day programs or if registered for the Convention. Spouses not registered for the Convention do not have access to the general lectures or to the exhibit hall.

To ensure that your requests are met — ***please register early***. Advance registrations will be accepted until **July 26th, 1996** after which date forms will be returned to the sender. Each on-site registration will be subject to a $30 administrative fee (GST included).

HOTEL RESERVATION

Type of Room:
☐ Single ☐ Double ☐ Twin ☐ Other (please specify)

_____

☐ Smoking ☐ Non-Smoking

Special Requests: _____

_____

Sharing with _____

Indicate your choice of hotel* (by numbering the boxes):
☐ Montréal Bonaventure Hilton ..... $149.00 single/double
☐ Queen Elizabeth ..... $148.00 single/double
☐ Château Champlain ..... $135.00 single/double
☐ Radisson/Auberge des Gouverneurs ..... $120.00 single/double
☐ Novotel ..... $106.00 single/double

* Prices do not include taxes.

Arrival Date: _____

Arrival Time: _____

Departure Date: _____

All changes and/or cancellations must be made **IN WRITING** through CDA Conventions. Fax to (613) 523-3062.

In order to reserve a room, a guarantee for the first night is essential. The guarantee will apply to the first night ONLY. To cancel your reservation advise CDA Conventions at least three (3) days prior to your projected arrival date.

CHEQUES WILL NOT BE ACCEPTED.
☐ MasterCard ☐ American Express ☐ VISA

Card # _____

Expiry Date _____

Name of Cardholder _____

SIGNATURE _____

DEADLINE for Reservations: July 26, 1996

ACCOMMODATION

☐ I do not require accommodation
☐ Other arrangements have been made

MAIL Pre-registration and Hotel Reservation Form with payment to:

1996 CDA Convention
1815 Alta Vista Drive
Ottawa, Ontario K1G 3Y6

OR FAX

(if paid by credit card): (613) 523-3062

MAKING YOUR AIRLINE RESERVATIONS

Special arrangements have been made with Air Canada to offer participants discounts on airfares.

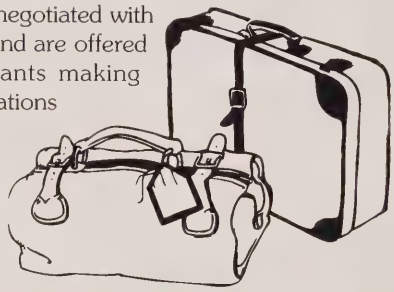
To take advantage of this service, you must call Air Canada Convention Central at **1-800-361-7585** and quote event **CV960671**.

ACCOMMODATION

Where To Stay In Montréal

The CDA 1996 Convention will take place in the Place Bonaventure Exhibit Halls and the Montréal Bonaventure Hilton.

For your convenience, we have secured room blocks in various hotels surrounding Place Bonaventure. Special convention room rates have been negotiated with the hotels and are offered to participants making their reservations with the CDA Convention Housing Bureau.



If you would like to make a hotel reservation or to register for the Convention and any of its ancillary events, please call CDA Conventions at 1-800-267-6354. A CDA 1996 enrolment and hotel reservation form can also be found at the end of this section of "blue pages" or in the preliminary program.

(1)	Place Bonaventure Exhibit Halls	
(2)	Montréal Bonaventure Hilton	$149 single / double
(3)	Queen Elizabeth	$148 single / double
(4)	Château Champlain / Marriott	$135 single / double
(5)	Radisson / Auberge des Gouverneurs	$120 single / double
(6)	Novotel	$106 single / double

TOGETHER IN '96 TOGETHER

M·O·N·T·R·É·A·L 1996

A Sensational Social Program

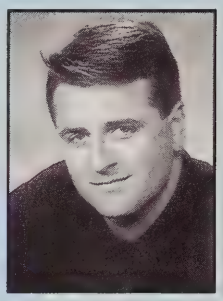
Ash Temple & CDA Conventions present ...

THE OPENING CEREMONY 1996

Sunday, August 18th · 5:00 pm - 7:00 pm

Michel Lauzière

FEATURING ... comedian Michel Lauzière and David Chilton, author of "The Wealthy Barber". Enjoy two hours of entertainment beginning with Michel Lauzière, a comedian who "thrives on weird ideas". His performance includes many innovative tricks including playing music with an electric mixer and squeezing into a huge inflated balloon! Michel Lauzière transcends linguistic and age barriers and is sure to have everyone laughing in their seats.



David Chilton

Following Michel Lauzière's presentation, the well-known author of "The Wealthy Barber", David Chilton, will take center stage. Although the topic of his presentation of personal finances and money management is of a more serious nature, he has a no-nonsense approach that will add flair and humour to his program. David Chilton will also have you laughing and chuckling in your seats during his presentation.

During David Chilton's section of the Opening Ceremony, clowns will entertain the children.

President's Gala: Dinner Cruise

Monday, August 19

7:00 - 8:00 pm — Cocktails

8:00 pm onward — Dinner, cruise & dancing

Enjoy a relaxing finish to your busy day by participating in the **President's Gala: Dinner Cruise**. Your evening will begin with cocktails on the deck of an anchored boat in the Montréal harbour. Next enjoy a sit-down dinner and watch the fading hues of the horizon as the sun sets. The melodic tunes of music will accompany dinner then invite you to dance away the evening under the stars.

For those who wish to experience the charm of days past you may board a replica of a Mississippi riverboat and go for a cruise, admiring the beautiful Montréal skyline from the water.

Dress for this event is smart casual.

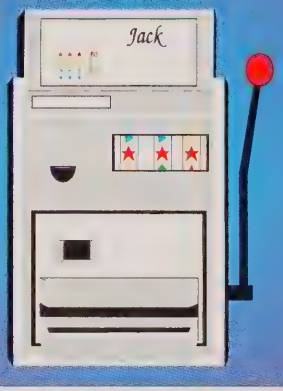
Following the Opening Ceremony, Convention participants may register to attend the light-hearted and exciting Casino Evening. Various gaming tables will be set up to entertain would-be high rollers.

Croupiers will help you place your bets but since your winnings or losses translate into funny money there's no stress — just a lot of fun.

Bring your family and meet your friend in an informal atmosphere.

A light meal will be served during this event.

MEET & GREET
CASINO NIGHT



Sunday, August 18
7:00 pm - 10:00 pm

The Opening Ceremony is open to all Convention participants but you must reserve your place to attend. TO REGISTER for a social event, just fill out the relevant sections of the registration form and send the appropriate fees where applicable.

VISITS AND ONE-DAY TOURS

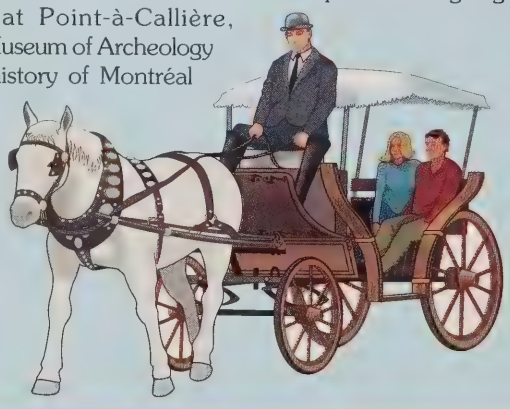
This year we have increased our day tours from 3 to 4 full days. Convention participants and accompanying spouses may enjoy a variety of day trips that will please even the most discriminating of tastes. From commentated walking tours to having lunch at a quaint old inn to delving into archeological ruins, there is sure to be something of interest for everyone.

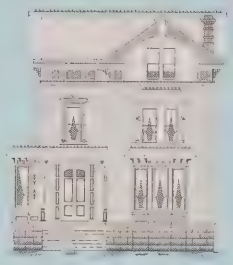
Saturday, August 17 — Deluxe City Tour

Tour some of Montréal's most celebrated attractions within the comforts of an air conditioned motorcoach. A knowledgeable and experienced guide will draw your attention to the numerous sites of one of Canada's most historical cities. Included in this tour is a visit to three of Montréal's primary attractions: The Olympic Tower, the Montréal Botanical Gardens and The Biodôme.

Sunday, August 18 — Discover Old Montréal

Begin your day with a commentated walking tour of Old Montréal. This is one of North America's largest historical areas and most remarkable architectural ensembles. Following the morning's tour, relax and enjoy a delightful luncheon in one of Old Montréal's fine restaurants. Then spend an intriguing afternoon at Point-à-Callière, Montréal's Museum of Archeology where the history of Montréal through the 17th, 18th and 19th centuries comes alive.





Monday, August 19 — A Day in Charming Knowlton

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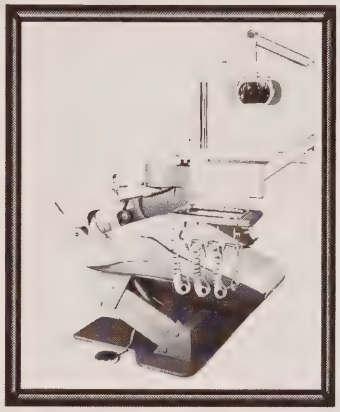

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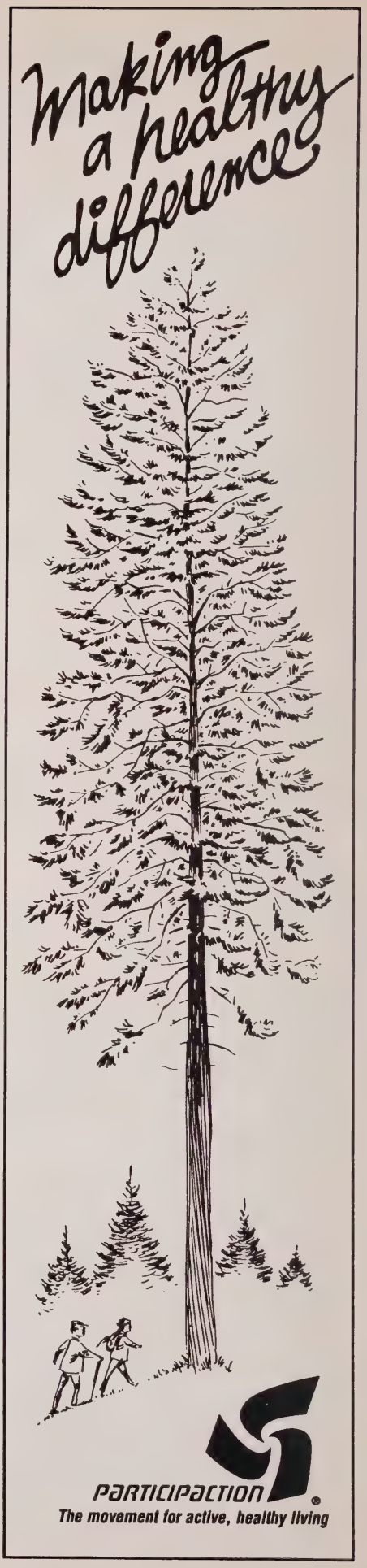

Time Is On Our Side

David Somer, DDS

Based on the comments I've received from dentists across Canada, there is a growing sense of urgency about the dental benefits issue. Some are clearly frustrated that dentistry isn't moving more quickly to combat managed care. Others are concerned about changes to conventional dental benefit plans, and the impact these changes will have on both their patients and their practises. But they also believe that immediate, visible, and strong action is required to combat the problem.

It is true that managed care has made some inroads into the Canadian dental benefits marketplace. Most of you are aware that Oralife is marketing its own brand of managed care, and selling shares on the stock market. You may also know that Liberty Mutual, through a subsidiary company called Managed Dental Care of Canada, is operating a preferred provider organization (PPO) in Ontario and Alberta. Or you may have been approached by the Altima Healthcare corporation, and asked to join its Ontario-based PPO.

But managed care is still an isolated phenomenon in Canada. I don't really like the analogy, but you can compare dentistry's position right now to the position of the United Nations in the days leading up to Desert Storm and the liberation of Kuwait. We have the time to move ahead carefully, in a planned way, to achieve the outcome we want.

This, frankly, is what CDA's steering committee on dental benefits issues is all about. Through the work of the committee, which met in Ottawa April 26-27, dentistry is marshalling its forces, and developing a winning strategy to combat the managed care issue.

This column could be viewed as the opening salvo in our campaign. It serves two basic purposes. First, it keeps dentists informed about the many changes taking place in the dental marketplace and provides them with strategies to cope with these changes. Second, it allows dentistry to communicate with its various publics in a cost-effective manner, and to have immediate input into the direction that dental benefit plans are taking in Canada.

But the Dental Benefits Issues column is just the beginning. At the provincial level, the Ontario Dental Association (ODA) has already conducted qualitative and quantitative studies to test the public's attitude toward third-party plans. This research involved focus groups, as well as a comprehensive telephone survey of dental patients who currently participate in an employer-sponsored dental benefits plan.

ODA's research was conducted to ascertain:

1. How much the consumers of dental care understand about their own dental benefit plans, as well as their knowledge about funding and administrative options such as higher copayments, defined contribution plans, flex care, health maintenance organizations (HMOs) and PPOs.
2. The motivation of the various groups that, either directly or indirectly, provide choices to the participants in dental plans, including employers, benefits consultants, and plan providers.
3. The value that plan participants place on dental care relative to other types of health care, such as vision care and drug plans.
4. The importance that employers place on dental care, versus other types of health care, when they determine the coverage mix of their employee benefits plan.

ODA is to be commended for undertaking this research, and for sharing its results with CDA and the steering committee. Their data not only gave us a point of comparison to conduct similar research in Quebec, it allowed us to avoid useless repetition, and to move our campaign into its next phase more quickly.

The focus group studies that CDA conducted in Montreal earlier this year identified some key differences between dental care consumers in Quebec and Ontario. For instance:

1. The high regard that Ontario patients have for their dentist was not fully shared by patients in Quebec.

Dr. David Somer maintains a private dental practice in Hamilton, Ontario. He is a member of CDA's executive council and the chairman of the CDA steering committee on dental benefits issues.

2. Quebec patients perceived the likelihood of their dental plan coverage being changed in the near future to be considerably more remote than Ontario patients did.
3. The concept of flex benefits was not as well understood in Quebec as in Ontario, nor was it seen to be advantageous. Ontario patients had a good understanding of flex benefit plans, and tended to be more receptive to the concept, as it allows individual requirements to be accommodated within a group plan.
4. The top priority of Ontario patients is to maintain the ability to choose their own dentist, while Quebec patients seem more concerned with maintaining their current levels of dental coverage.

Given the discrepancies between the data collected in Quebec and Ontario, the steering committee believes that further research should be conducted in other regions of the country to identify both national and regional trends. This will allow the committee to develop an effective national strategy in response to the managed care issue, as well as to assist provincial associations in the development of regional strategies.

In the final analysis, however, communication with all interested stakeholders will be the key to successfully managing this crucial issue on behalf of our members, the dental profession, and our patients.

Next month, and in subsequent columns, I will outline CDA's communications strategies, and review the progress we have made to date on the managed care issue. ■

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Common Stock	**18.9%**	21.2%	**10.5%**	11.7%	**10.3%**	10.8%	✔ **8.7%**	8.0%
Balanced	✔ **17.9%**	15.7%	✔ **9.9%**	9.8%	**9.9%**	10.1%	✔ **8.9%**	8.2%
Bond & Mortgage	✔ **11.0%**	9.6%	✔ **8.1%**	7.0%	✔ **9.9%**	9.1%	✔ **9.8%**	9.2%
Money Market	✔ **6.6%**	5.8%	✔ **5.6%**	4.9%	✔ **6.2%**	5.7%	✔ **8.1%**	7.7%
International Equity	✔ **24.9%**	18.4%	n/a		n/a		n/a	
European	✔ **23.8%**	17.0%	n/a		n/a		n/a	
Pacific Basin	✔ **26.0%**	13.2%	n/a		n/a		n/a	
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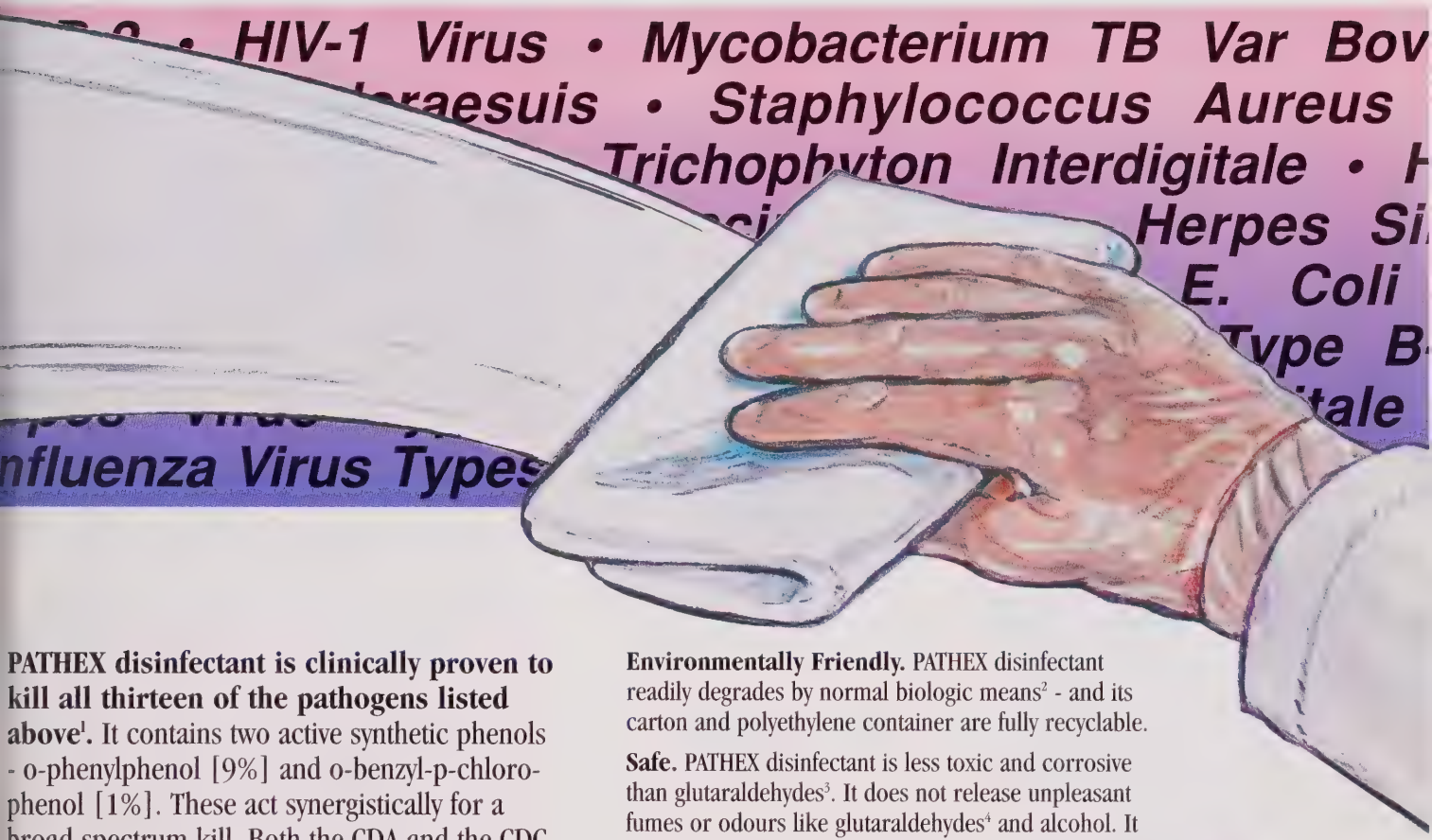
† *CDA figures indicate annual compound rate of return with all fees deducted. The figures are historic rates based on past performance and are not necessarily indicative of future performance.*

* *Comparison performance figures are Globe and Mail averages for the range of similar funds offered in the marketplace before sales charges, as published in the May 16, 1996 issue.*

For current unit values and GIC rates call CDSPI toll-free at: 1-800-561-9401, ext. 525. (Metro Toronto call: (416) 296-9401.)

CDSPI

Does Your Disinfectant Kill As Many Organisms As PATHEX?



PATHEX disinfectant is clinically proven to kill all thirteen of the pathogens listed above[1]. It contains two active synthetic phenols - o-phenylphenol [9%] and o-benzyl-p-chlorophenol [1%]. These act synergistically for a broad spectrum kill. Both the CDA and the CDC have recommended phenolic compounds in their published recommendations for infection control practices.

Versatile. When diluted 1:32, PATHEX disinfectant is a powerful pre-cleaner for instruments and surfaces and is an effective immersion solution. At 1:128 dilution, it makes an ideal holding solution and ultrasonic solution. Unlike alcohol-based disinfectants, PATHEX disinfectant can penetrate, emulsify and rinse away tissue proteins (blood, saliva, etc.), yet it will maintain its biocidal activity. And, it is not deactivated by soaps or hard water, like quaternary ammonium compounds.

Environmentally Friendly. PATHEX disinfectant readily degrades by normal biologic means[2] - and its carton and polyethylene container are fully recyclable.

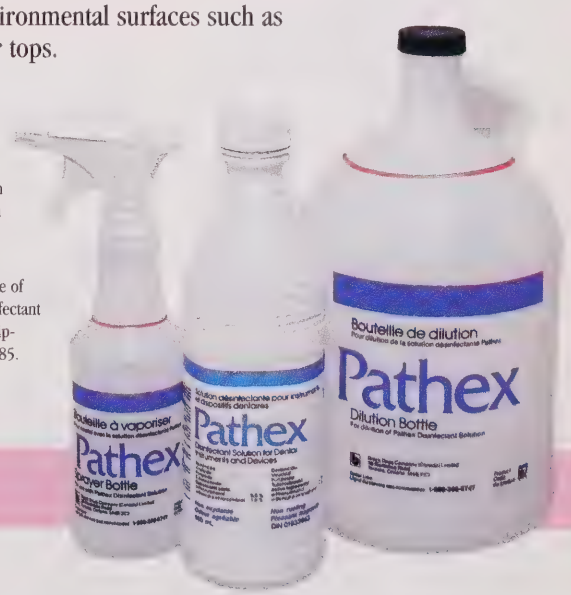
Safe. PATHEX disinfectant is less toxic and corrosive than glutaraldehydes[3]. It does not release unpleasant fumes or odours like glutaraldehydes[4] and alcohol. It is also easy on environmental surfaces such as chairs and counter tops.

References:

1 Data on file.

2 Block, Seymour S. Disinfection, Sterilization and Preservation. Fourth Edition, 1991.

3,4 ADA Council on Dental Therapeutics. Acceptance of (Synthetic Phenol) disinfectant for instruments and equipment. JADA 110:394, 1985.



Pathex

*™ Block Drug Company (Canada) Ltd.
Oral Health Care Division
1-800-387-4588

LISTERINE*

FIGHTS GINGIVITIS AS EFFECTIVELY AS CHLORHEXIDINE.

LISTERINE ANTISEPTIC - ANTIPLAQUE ANTIGINGIVITIS - MOUTHWASH
INDICATIONS: Helps reduce gingivitis (minor inflammation of the gums caused by plaque above the gumline) when used in a conscientiously applied program of oral hygiene and dental care. Kills the germs that cause bad breath, plaque, gingivitis and sore throats due to colds. CAUTIONS: Keep out of reach of children. Do not swallow. Not to be used by children under 12 years of age. In case of accidental ingestion, contact a Poison Control Centre or doctor immediately. DOSAGE: Rinse full strength with 20 mL for 30 seconds twice a day. MEDICINAL INGREDIENTS: Eucalyptol 0.091% w/v, Thymol 0.063% w/v, Menthol 0.042% w/v. NON-MEDICINAL INGREDIENT: Alcohol. NOTE: Cold temperatures may cloud this product, its efficacy will not be affected. SUPPLIED: Original Listerine: Clear, amber liquid available in bottles of 250, 500, 750, and 1,000 mL. Cool Mint Listerine: Clear, blue, cool mint flavoured liquid available in bottles of 250, 500, 750, and 1,000 mL. Fresh Burst Listerine: Clear, green, mint flavoured liquid available in bottles of 250, 500, 750, and 1,000 mL

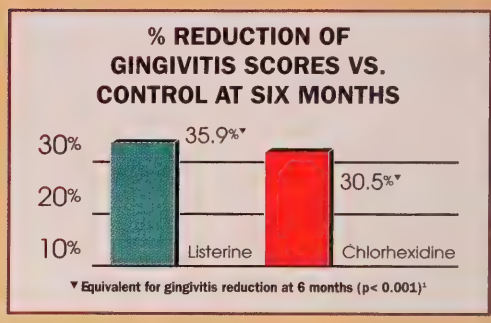
† "Listerine helps reduce gingivitis (minor inflammation of the gums caused by plaque above the gumline) when used in a conscientiously applied program of oral hygiene and dental care." CANADIAN DENTAL ASSOCIATION ‡ Gingivitis was evaluated using the Modified Gingival Index.

*™ Warner-Lambert Company Warner Wellcome Inc. use Scarborough, Ontario M1L 2N3.

1. Overholser CD et al. Comparative effects of two chemotherapeutic mouthrinses on the development of supragingival dental plaque and gingivitis. *J Clin Periodontol* 1990;17:575-579
2. Data on file, 1995.

PAAB

A recent clinical study[1] concluded that Listerine inhibited the development of gingivitis‡ as effectively as 0.12% chlorhexidine. In fact, Listerine reduced the development of gingivitis by almost 36% over brushing and flossing alone[1].



Unlike chlorhexidine, Listerine works without causing side effects like extrinsic tooth stain[1]. Listerine is the only oral rinse, prescription or nonprescription, to receive the Canadian Dental Association's Seal of Recognition† for efficacy in the reduction of plaque and gingivitis[2]. Twice daily rinsing with Listerine works synergistically with brushing, flossing and your professional care[1]. If you'd like to find out more about Listerine call 1-800-683-1650. We'll give you all the facts.

LISTERINE FIGHTS GINGIVITIS WITHOUT STAINING

9768

7 DAYS

THIS BOOK MAY BE KEPT FOR
7 DAYS ONLY
IT CANNOT BE RENEWED

JUL 28 1997
FEB 19 1998
JUN 30 1998
JUL 15 1998
AUG 27 1998
FEB 9 2001
NOV 12 2001
JUN 18 2002
MAR 23 2004
JUN 16 2008

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CANADIAN DENTAL ASSOCIATION.
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